

NAVY MEDICINE

March-April 2005



Tsunami Relief

NAVY MEDICINE

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Surgeon General of the Navy
Chief, BUMED
VADM Donald C. Arthur, MC, USN

Deputy Surgeon General
Deputy Chief, BUMED
RADM Kathleen Martin, SHCE, USN

Editor
Jan Kenneth Herman

Assistant Editor
Janice Marie Hores

Staff Writer
André B. Sobocinski

Book Review Editor
LCDR Y.H. Aboul-Enein, MSC, USN

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COVER: LT Mark Banks, MSC, tends to a victim of the earthquake-tsunami at a temporary triage site in Aceh, Sumatra. Story on page 8. Photo by PH2 Elizabeth A. Edwards.

CORRECTION: The cover caption in the January-February 2005 issue stated that Dr. Berley was a prisoner of war for 2½ years. Dr. Berley was imprisoned for 3½ years. We apologize for the error.

Admiral's Call



I recently had the honor and privilege to visit Navy medical personnel deployed in Iraq and supporting our forces engaged in Operation Iraqi Freedom. My primary reason for visiting was to convey my appreciation for the outstanding work these superb men and women were performing under very challenging circumstances and to determine how we at Navy medicine headquarters could better support their needs.

I visited our staff in Kuwait, Baghdad, and several Marine Corps bases throughout Iraq and a casualty evacuation unit which delivers injured Marines and Sailors to the operating rooms where lives are saved. From my experience, we are seeing some incredibly injured patients—more seriously injured than in any other conflict in history—and their lives are being saved. Some may attribute our relatively low mortality rates to advances in medical technology such as QuikClot®, better body armor, or improved battlefield logistics. While these improvements certainly contribute to our successes, from my perspective the most important contributor to saving lives on the battlefield has been, and remains, our corpsmen.

The bravery and knowledge of our corpsmen in the field are remarkable and inspiring. Our corpsmen are saving lives and helping Marines and Sailors survive significant injuries because they are there—fighting and serving alongside Marines doing the right things, at the right time, every time. Navy medicine and these corpsmen, in particular, are

part of our nation's military, not just a subset of healthcare providers. In fact, these brave corpsmen have exemplified the well-known saying that "No Marine has ever taken a hill out of the sight of a Navy corpsman."

It is amazing and humbling to see the spirit and determination of our forces in combat. These young Marines and Sailors are totally focused on their mission. Our forces are answering the call to duty magnificently and their performance in the global war on terrorism should make you proud. I assure you, having seen these heroic young men and women in action, I could not be more proud to wear this uniform.

I also want to mention the hospital ship USNS *Mercy* is steaming en route to Southeast Asia—as of this writing—to render support to the humanitarian assistance/disaster relief efforts resulting from the 26 December tsunami. The ship and its embarked medical teams are involved in an important mission designed to prevent further loss of life, reduce suffering, and improve public health in the affected areas.

As one of two very capable Navy hospital ships, *Mercy* deploys with a robust medical capability and support services appropriate for disaster relief. *Mercy* is prepared to offer shipboard health services and provide sea-based support to a variety of military and civilian support agencies, including U.S. non-government organizations, involved in this relief effort.

Our Navy medical forces in Afghanistan and Iraq, and aboard *Mercy* clearly epitomize the Navy medicine motto, "Steaming to Assist."

*Vice Admiral Don Arthur, MC, USN
Surgeon General of the Navy*

Top: VADM Arthur adds his signature to the sign in front of the Surgical Shock Trauma Platoon in Iraq and shakes hands with some enlisted troops during his visit. Photos by LCPL T.J. Kaemmerer



Deploying Navy Medicine

Since 11 September 2001, the Navy and Marine Corps have been involved in the global war on terror to include Operations Noble Eagle, Enduring Freedom, Iraqi Freedom I, and Iraqi Freedom II. With the United States military heavily engaged in these major operations and small scale contingency missions around the world, it is likely that you or a colleague will be deployed within the next 24 months to support one or more of these missions either through a platform or individual augmentation assignment.

This is the first in a series of articles about Navy medical support and how men and women of the Navy Medical Department are selected.

Who are the operating forces? They are the Unified Combatant Commands (UCC), more specifically, U.S. Joint Forces Command (JFCOM), European Command (EUCOM), Southern Command (SOUTHCOM), Northern Command (NORTHCOM), Central Command (CENTCOM), Pacific Command (PACOM), Special Operations Command (SOCOM), Transportation Command (TRANSCOM), Strategic Command (STRATCOM), and Space Command (SPACECOM).

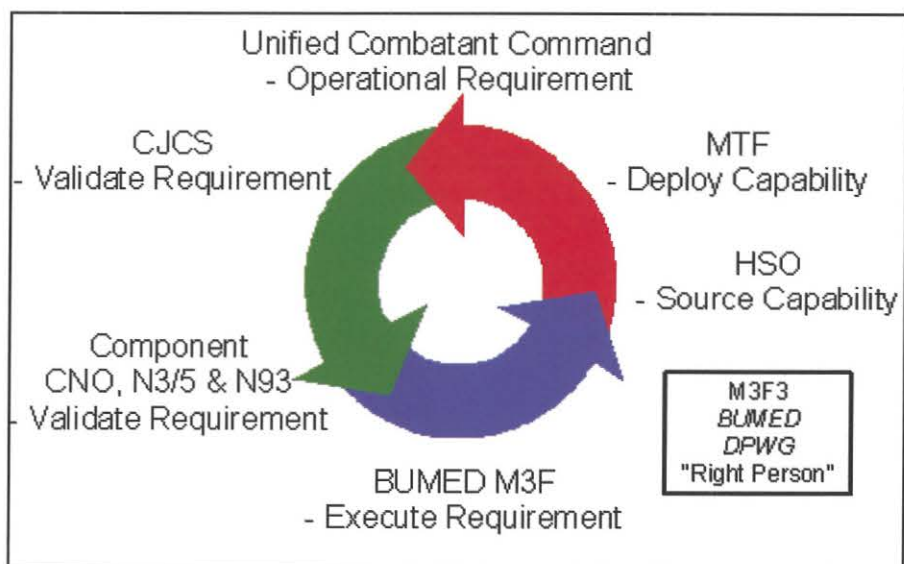


Figure 1

These commands have either regional or functional missions and are characterized by broad, continuing missions under a single commander which is composed of forces from two or more military departments. The Combatant Command (COCOM) requests the assignment of forces from the Services in order to accomplish its mission. These forces include Health Services Support (HSS) capability.

To accomplish their mission the requesting UCC issues a Request for Forces (RFF). All Service forces are assigned to the COCOM by the Secretary of Defense (SECDEF). The Joint Chiefs of Staff (JCS) validates the force for the mission and directs the Service Chiefs to source the capability. The service chief of the Navy is the Chief of Naval Operations (CNO). His command, Naval Operations (OPNAV), and the Plans

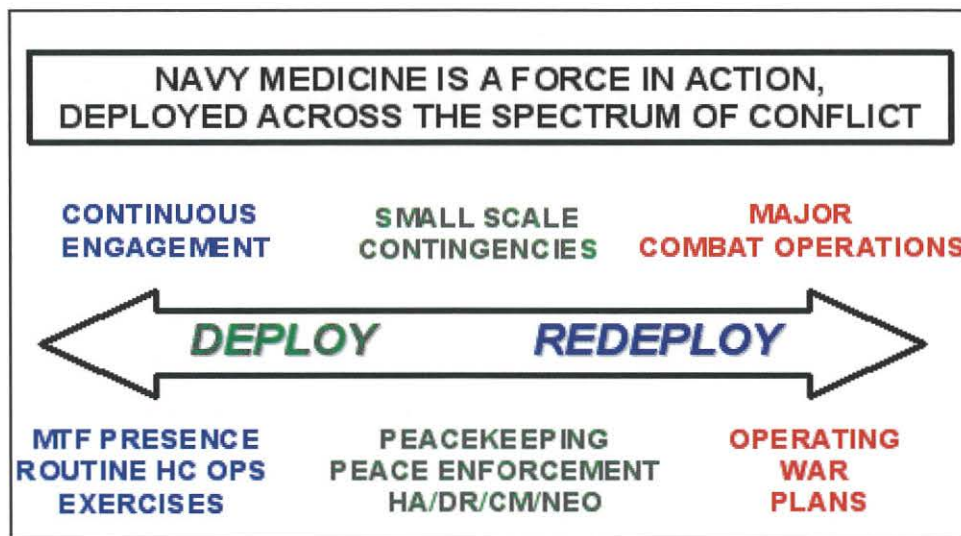


Figure 2

and Operations office (OPNAV N3/5) with the assistance of the office of the Surgeon General (N93), directs the assignment of Navy medicine forces. Figure (1) illustrates this process.

With the issue of the deployment order (DEPORD) from the CNO, the Bureau of Medicine and Surgery (BUMED) Fleet Operations Support (M3F) directs the assignment of either a specific Navy medicine platform, individual personnel, or group of naval officers or Sailors organized against an operating force platform. The Plans and Operations Directorate (M3F3) coordinates within BUMED through the Deliberate Planning Working Group (DPWG) or conducts liaison with other BUMED activities, services, or agencies to provide the COCOM or other supported agency with the desired capability.

BUMED (M3F3) then coordinates with regional Healthcare Support Offices (HSO) who coordinate among Navy medicine resources within their areas of responsibility.

HSO serves as a critical enabler for medical treatment facilities (MTF) to mitigate the impact of deploying Navy medicine personnel in support of the warfighter.

The MTF maintains the most important element of Navy medicine's support to the operating forces—the men and women of the Navy Medical Department. The term “MTF” doesn't accurately describe their role in support of the UCC. Navy medicine facilities are more accurately described as force projection platforms (FPP). Specifically, Navy medicine is employed 100 percent of the time, either providing warfighters, their families, or retiree's healthcare in garrison, port, or deployed afloat or ashore. Navy medicine is fully engaged by providing healthcare in direct support across the range of military operations (ROMO). Figure (2) illustrates this concept.

Deploying Navy medical personnel in support of any mission requires communication at all levels of the

chain of command. Evolution of our Navy strategies, such as the Fleet Response Plan (FRP), reflects upon our naval heritage. Navy medicine is part of that expeditionary culture.

The warfighter requires consistent medical capabilities which are built on a well-resourced foundation of support driven by operating force requirements. Part of institutionalizing this capability requires that processes are clearly identified and understood by all members of Navy medicine. We are an expeditionary culture of readiness. Future articles will further detail the processes that contribute to our Navy medicine. □

—Series by the staff of Plans and Operations Directorate (M3F3), Fleet Operations Support, Bureau of Medicine and Surgery, Washington, DC.

Facilities News

James R. Brassfield

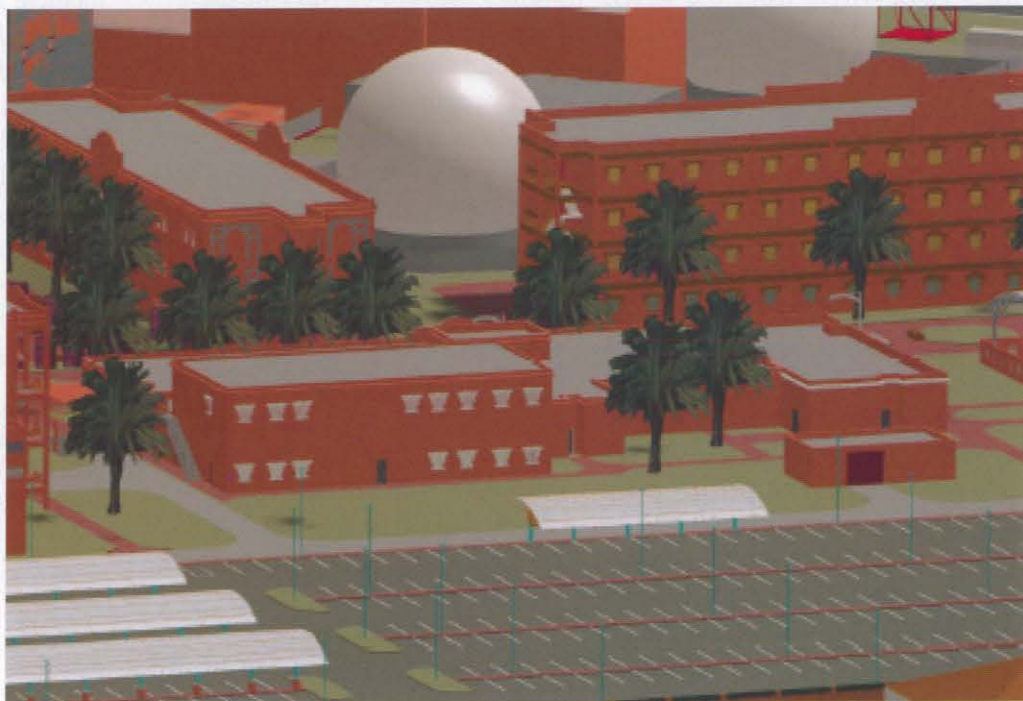
Several BUMED facilities improvements around the world in 2004 include the Naval Submarine Base in Groton, CT, where work continues to rehabilitate the Ambulatory Care Clinic. This building will be completely transformed from the hospital it once was to a modern outpatient facility consolidating medical functions formally scattered around the base. Immediately next door, construction has begun on the replacement dental clinic which was previously located in dilapidated buildings near pier side. Also awarded for construction in 2004 is the renovation of a building at the Washington Navy Yard to accommodate both medical and dental facilities in one building. This project will require about 20 months of renovation until completion in 2006.

In the 2005 military construction program, replacement of the recruit medical clinic at Marine Corps Recruit Depot Parris Island is planned at an estimated cost of \$25 million. This facility will expand and improve in-processing capability at Parris Island both for medical and dental functions. It will also provide much needed enhanced sick call space. Also included in the 2005 program is an addition and alteration for Naval Hospital Jacksonville. This addition will expand labor and delivery capability as well as provide more outpatient space and

enhanced ancillary departments. Finally, in FY05 a new dental clinic will be built at Diego Garcia, freeing up space in the medical clinic for a complete future modification for medical functions in the existing building.

In FY06 we hope to achieve approval of a consolidated medical clinic at Naval Weapons Station Charleston to allow us to move out of the old Charleston hospital and relocate to the Nuclear Power Training School site, which is also near military housing areas. This project is estimated to cost \$35 million for the Navy portion. The VA will join us with their own space as part of this consolidation. The 35-year-old Charleston Naval Hospital will eventually be given up to the federal excess building process.

Navy Support Activity Bahrain will receive badly needed additional medical space as the mission grows at that forward location. A dental addition at Bahrain is



Proposed medical clinic addition, Jufair, Bahrain

Drawings courtesy of author



Proposed Academic Program Center/Grad School of Nursing, Uniformed Services University of the Health Sciences.

already under construction which was approved in 2004 as an Unspecified Minor Military Construction project. At Naval Medical Center San Diego we hope to execute a design/build project to construct a parking facility for 1,000 vehicles. This will improve, to some extent, the parking shortfall at that hospital. Finally, in 2006 an addition to the Uniformed Services University of the Health Sciences campus is proposed to provide an Academic Program Center and Graduate School of Nursing.

FY07 begins a major effort to improve our large facilities at Guam and Great Lakes. Design of the replacement USNH Guam was begun on 14 December 2004. The hospital is to be rebuilt on the existing hospital compound in the center of the island. This project also includes a VA component which will be housed in their own clinic near our new hospital. At Great Lakes the Navy continues to negotiate with the North Chicago VA Medical Center in an effort to consolidate our capabilities at the North Chicago VA campus. Design of this major coordinated effort should begin in 2005 with a view toward gaining congressional approval for construction in FY07 or 08.

The environmental preventive medicine community can also look forward to two new facilities. Design is well along on the replacement EPMU at Sigonella, Sicily, and

we will begin another design in January 2005 to replace the Pearl Harbor EPMU. Both these replacements are intended to be included in the FY07 MILCON program.

Finally, the base closure process is well underway. This program could result in several medical facility enhancements around the country. As the program is still undergoing many scenarios, the results will not be known until 2005, but the outcome could certainly improve some of our facilities around the country and also save lots of DOD money in the future by realigning bases no longer required.

For the moment, that's what we have in our sights at the BUMED Facilities Division. However, in the future, we also see the need to plan for other major initiatives at our critical hospitals at both Camp Pendleton, CA, and Beaufort, SC. We'll have more on those possibilities in future news. □

Mr. Brassfield was recent Deputy Director and Chief Architect, BUMED (M3M3B), Washington, DC.

USNH Okinawa Sends Medical Relief and Supplies to Southeast Asia

Amanda M. Woodhead

Seventeen service members from U.S. Naval Hospital, Okinawa, augmented the 3rd Medical Battalion on 1 January 2005, in support of the humanitarian mission in Indonesia and Sri Lanka. In addition to personnel, the hospital also sent 18 pallets of humanitarian relief medical supplies totaling \$156,000 for the victims of the 26 December earthquake and resulting tsunami.

The team consisted of two general surgeons, anesthesiologists, perioperative nurses, and independent duty corpsmen; three family medicine physicians; five medical surgical nurses; and one physician assistant. Also, six field medical technicians (hospital corpsmen) have been placed on standby to assist with force health protection if needed.

According to CDR Thomas J. Petrilak, MSC, Director for Administration, the hospital was notified Thursday, 30 December that the team would likely deploy over the weekend. "We received approval to release 17 medical assets at midnight of 31 December and then worked over the next 48 hours to clear them for the operation," Petrilak said. He



Photos by HM2 Shauna J. Keefe, USN

Hospital corpsmen load pallets of medical supplies on New Years Eve for deployment to Sri Lanka and Indonesia on board USS *Fort McHenry*. The hospital also sent 17 medical personnel to augment the 3rd Medical Battalion.

went on to say that despite the short notice and New Years Eve holiday, 18 additional primary care providers were available at Evans Branch Medical Clinic to provide readiness immunizations and medical clearance for the Marines and hospital staff deploying.

CDR Kathy M. Natoli, NC, department head of Evans Branch Medical Clinic, explained how the process evolved. "Over the weekend, we conducted pre-deployment screens, treated, and released over 600 Marines and Sailors to support the humanitarian mission. Some re-



CDR Kathy M. Natoli, NC (far right) and staff from the Evans Branch Medical Clinic treated 600 Marines and Sailors over the New Years weekend in preparation for a 2 January departure to Sri Lanka and Indonesia.

quired dental checks so we sent them upstairs to 3rd Dental Battalion and when they returned we released them as medically ready and they were on their way. Other Marines needed immunizations or routine tests that we were able to provide here in the clinic. After that, they were cleared and released to deploy. The high state of medical readiness of the Marines and Sailors expedited the process and we were able to easily fill any gaps. This really helped. And, even though it was busy, we were proud to contribute to the cause," said Natoli.

The pallets of medical supplies were organized by LT Willie J. Brown, MSC, department head for the Materials Management Department, and included medications, immunizations, and equipment for the relief effort. "Once the shipment was approved, we pre-staged an itemized list of materials that would be packaged. The hospitals' materials management staff pulled supplies

from the warehouse while coordinating the logistics for delivery at White Beach with USS *Fort McHenry*. It was a gutsy effort that required corpsmen to work overtime and over holidays to ensure the supplies could be shipped at a moment's notice and it was quite a success," Brown said of the supplies that supplemented the medical team.


Four of the medical personnel deployed had plans to be on leave during this time and traded in their travel tickets for temporary duty orders. One of them, LT John B. Gore, NC, a perioperative nurse in the main operating room, was already packed for a 3-week vacation with his family in Mississippi and was scheduled to leave on 3 January. "When we told him about his deployment, and how he would be helping other people, Gore was excited and looking forward to the challenge regardless of the change to his travel plans," commented CAPT Jan M. Carrio, NC,

Director of Nursing Services for the hospital.

Despite the short notice assignment and significant amount of personnel deployed, business will carry on as usual at USNH, Okinawa. CAPT Susan L. Chittum, MC, Director of Surgical Services explained how the clinics would be covered while the staff members are away. "The commanding officer met with the hospital directors on 3 January and worked on restructuring the primary care clinics and other ancillary services affected by the deployment making it possible to return to business as usual the next day. We moved assets around to provide the highest level of coverage island-wide while ensuring the patients would maintain their access to care. This includes transportation routes for our couriers that deliver labs and medical records to the main hospital from the branch clinics. While there may be brief delays in elective or voluntary surgeries, no other change in service or availability is expected," Chittum said. She also included, "We stand ready to support the operational readiness and promote, maintain, and restore the health of those we serve."

The Armed Services Blood Bank at the hospital also sent 100 units of blood to the affected areas and will be holding blood drives next week to replenish blood supplies and prepare for any additional requests from the Pacific area. □

Ms. Woodhead is Public Affairs Officer, U.S. Naval Hospital, Okinawa.

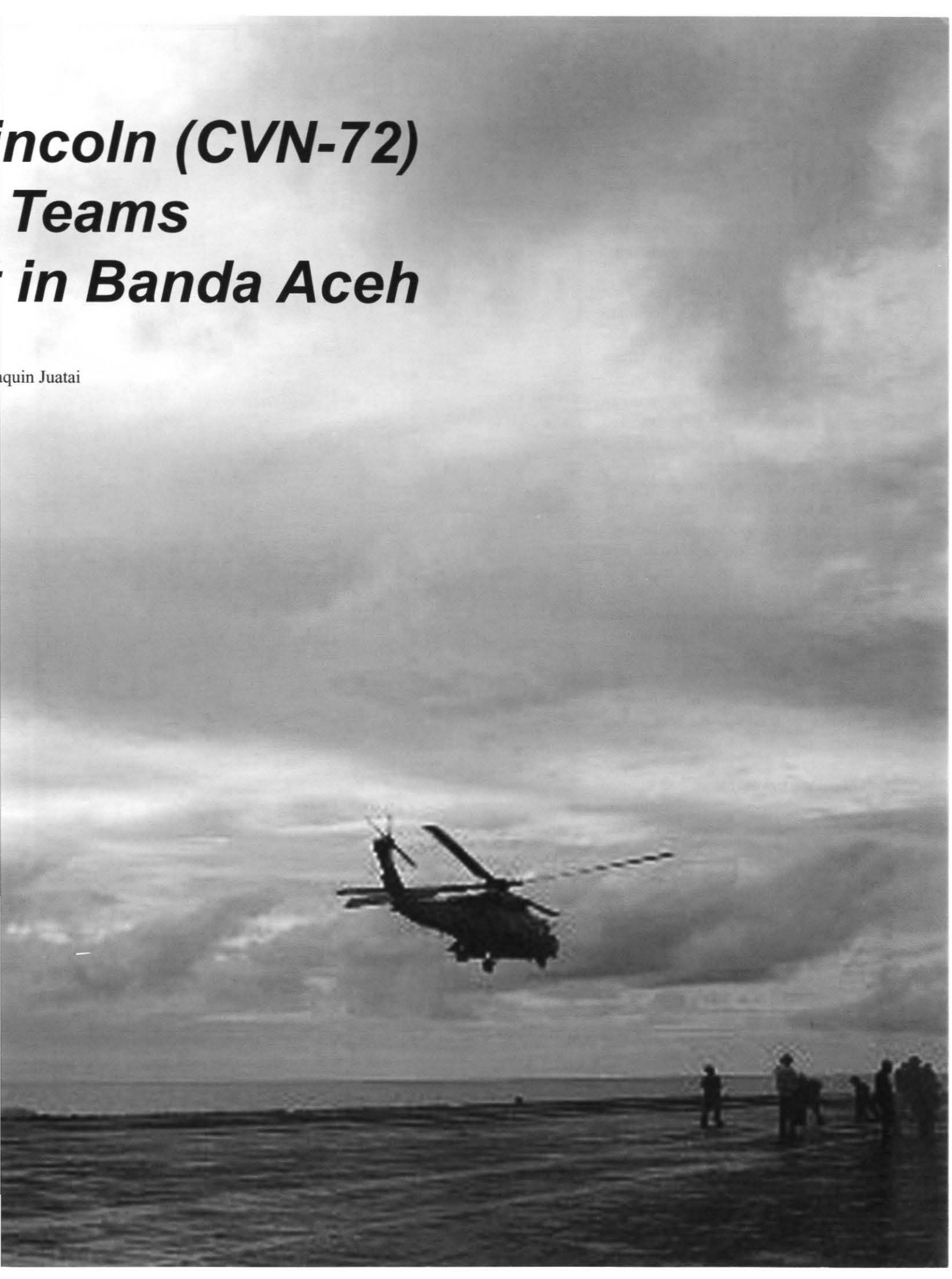
A full-page photograph of a seascape at sunset or sunrise. The sky is filled with large, textured clouds, with a bright glow from the sun breaking through near the center. The horizon line is low, showing the sea and distant land. In the bottom right foreground, a person is silhouetted, standing and looking out at the water.

USS Abraham Lincoln Medical Center Provide Support

JO1 (SW)

Lincoln (CVN-72) Teams in Banda Aceh

Quin Juatai



On 3 January 2005 in Banda Aceh, Sumatra, Indonesia, the heat was close and all pervasive. It permeated every pore. The air in the green army-style tent that served as a triage center provided some shade, but nothing truly alleviated the oppressive heat. Even a side panel of the tent canopy rolled up to allow what little breeze was available to pass through had no effect.

The heat made a 50-yard trip difficult at best. A 100-150-yard run to an arriving helicopter, followed by the grueling return to the tent carrying a stretcher over the rough, muddy terrain was punishing. But the punishment was worth it for six members of USS *Abraham Lincoln*'s (CVN-72) medical department. The three hospital corpsmen and three Navy doctors working from the tent alongside international aid workers wouldn't had it any other way.

Lincoln was in its third day of humanitarian relief efforts in Banda Aceh, and the pace of helicopter sorties, of food and medical supply deliveries, and of evacuations was steadily picking up. On 2 January, *Lincoln*'s medical team only triaged a handful of patients. Twenty-six people made the trip through the tent on 3 January.

Although conditions at the airfield outside Banda Aceh were primitive at best, *Abraham Lincoln* Carrier Strike Group (ALCSG) Sailors were doing all they could to lend assistance. The medical personnel working in the triage tent were no exception, but the conditions made treatment difficult. Flashlights were the only available light in the tent aside from what little light came in through the open panels. The floor was a large yellow tarp. A portable medical locker from the carrier was the primary source of medical supplies. HMC(SW/AW)



Photo by Photographer's Mate Airman Jordan R. Beasley

A lone hand salute is rendered by an Indonesian child as a Navy helicopter lifts off after delivering food and water in Lamno, Sumatra, Indonesia.

Jim Jones augmented these supplies from the back of a large truck carrying boxes labeled "3rd Marine Division medical supplies." Jones, HM1 Rebecca McClung, and HM3 Casey Wheeler jumped into the back of the truck and started shuffling through the boxes, looking for much needed extras such as bandages, medical gloves, and the like. They found IV fluid and duct tape—both of which

were needed in their makeshift medical center. These supplies were not enough. The corpsmen and "docs" started their day by sorting through what they had, and making lists of additional supplies needed to continue operating out of the tent.

The International Organization for Migration (IOM) was the main source of emergency medical care at the airstrip. They were also the only

Indonesian translators available to medical personnel. Their assistance proved vital throughout the day; none of the Sailors spoke Indonesian, and none of the evacuated survivors spoke any English.

The entire triage operation was being run by Wing Commander William Griggs of the Royal Australian Air Force. Griggs is an aeromedical team specialist and an Air Force reservist.

His normal job is as the director of the trauma center in the Royal Adelaide Hospital in Adelaide, Australia.

He was one of the very first international aid workers to arrive at Aceh, flying in on the 29th of December, just 3 days after the tsunami hit.

"When we triage," said Griggs, "we only do treatment we have to do. If they [patients] don't need treatment

right now and it's not simple stuff [treatment], we send them on."

Griggs was coordinating efforts with US care givers from the ALC-SG, Chinese aid workers, the IOM, Spanish medical teams, and two local Indonesian hospitals.

Both hospitals survived the tsunami but they were full. Aid workers at the airfield had no choice but to send injured survivors there. The triage tents were set up to help sort through wounded survivors and get them to the best treatment possible as quickly as possible. Surgery in these primitive conditions was impossible.

According to LT Mark Banks, MSC, a physician assistant from *Lincoln*, the plan for the day was fairly simple. "As helos take out supplies, they're going to bring back casualties. Some we can treat here, some have to go to the hospital."

Jones carried one of the first victims to arrive off the helicopter. A 9-year-old boy, frail and suffering from a large, infected ulceration under his arm. Jones said the child's reaction was all he needed to be motivated to help. "You never know how you're going to react to anything. It was good to get that first thing," Jones explained. "The aircrew guy handed him to me and he just put his arms right around me and put his head down as I carried him out of there and I just went, 'ah, man!' So that got me going; that got me fired up. Now we knew we had some work to do."

LT Lisa Peterson, MC, said she was glad to be there offering help, but that the task was a big one. "Our part was just a small, person-by-person part, but I'm glad I could be a part of it and help out in small ways."

Peterson is the flight surgeon for Carrier Air Wing Two, and was one of the three doctors on hand on the 3rd. She played an important role.



LT Peterson unloads stretchers from a truck to use at a nearby triage site.

Although everyone knew when helicopters were approaching, it was Peterson who had the only walkie-talkie in the group, and who could find out whether or not there were injured aboard the helicopters. By communicating with ground controllers from *Lincoln*, who were in communications with the helicopters, she was able to find out whether or not medical help was needed. Her call would send stretcher-bearers out to the helicopters, or keep them resting in the shade.

The stretcher-bearers epitomize the cooperative sense of the day—of the entire relief effort. Indonesian soldiers and US Sailors teamed up to carry wounded to the triage tent. IOM workers would grab a stretcher handle, and Chinese medical technicians would check vital signs. There were plenty of people available to help treat the injured, and they did it quickly and efficiently.

“We would have been lost without our IV lady,” joked Jones to McClung. One of the IOM workers showed a



From left: LT Mark Banks, HMC Jim Jones, HM1 Rebecca McClung, and LT Lisa Peterson, carry a patient on a stretcher flown-in by a Navy helicopter to a temporary triage site.

particular talent for finding patient’s veins to insert IV needles. Most of the patients were so dehydrated that finding a vein was a challenge even for the most experienced.

According to McClung, being there was the right thing to do. “Anything to help,” she said. “We’re

there to help” was the overwhelming sentiment of the men and women of ALCSG. None of these Sailors was closer to the action than these medical personnel. Though they were miles from the actual devastation, they were on the front lines directly assisting the injured survivors as soon as they were brought to them.

The official label given to the evacuated tsunami survivors by the international aid organizations was “indigenous displaced persons,” or IDPs. Men, women, and children with wounds received during the tsunami and its aftermath were being flown in to Aceh throughout the day. From the triage tent at the edge of the tarmac, they were either sent to the hospitals, or, if their wounds were quickly and easily treated, to the IDP camps located nearby.

Wounds include broken limbs. Scrapes—massive scrapes—and lacerations were common. Infection and dehydration were predominant and usually severe. According to Banks, sorting out the wounded, treating what they could, and send-



Tsunami victims receive medical attention from Navy medical personnel and aid workers at Sultan Iskandar Muda Air Force Base in Banda Aceh.

Photo by PH2 Elizabeth A. Edwards

Photo by PH3 Benjamin D. Glass



HM1 Rebecca McClung, left, and HMC Jim Jones, right, give medical attention to an injured Indonesian man.

ing patients on to the appropriate treatment centers was involved, but absolutely necessary.

"We had to decide how many people were coming out, what kind of things we were using up. There were supply issues. We needed to keep track of all that stuff," he said. Also of concern were the mental and physical health of the medical personnel.

Jones and Wheeler had to dig a latrine trench a distance away from medical facilities. There were no bathrooms, and human waste as well as trash and refuse from the IDPs and aid workers at the airfield created a potential health hazard to the relief workers. Sailors from the working party did a walk-down of the area, picking up discarded water bottles, paper, general trash created by the hundreds of aid workers staging at the field. The monsoon rains also created potential health hazards. Standing water is the mosquito's breeding ground, and malaria is prevalent in this area of the world.

By 2:20 in the afternoon, the helicopters had brought in 15 of the

day's patients. All had been triaged and put into the back of a large panel truck that served as an ambulance. The medical crew, who were drinking bottled water constantly and sweating just as constantly, rested in the shade of the returned "ambulance," leaning against stretchers standing against the truck's side. They heard the radio call and perked up.

Another flight of helicopters was coming in.

"We've got 22 people on board, sir, but we don't know if they're all patients," Jones reported.

"Which field are they landing on?" Banks asked, referring to the fact that helicopters were using the landing strip, the taxiway, and a soccer field behind the airport to land. "Right out here," replied Jones, referring to the taxiway nearest to the triage tent.

Indonesian soldiers and US Sailors grabbed stretchers as the helos landed. There was a sense of urgency as each bird hit the tarmac. Carrying patients from the soccer field was the hardest on stretcher-bearers, as it was the farthest away from the tri-

age tent, and they had to cross deep drainage trenches while carrying their patients.

"More?" was a question asked repeatedly, but the work came in fits and starts. Each helicopter flight came back only after delivering much needed supplies. Some had evacuees, some had injured. "It depended on what things looked like in the field," said Banks.

Although the idea of sending out triage teams in the helos had been talked of, the decision was made to keep the medical teams in one place. Perhaps the next day would afford enough space amidst relief supplies for a corpsman and a doctor to fly with them and decide in the field what patient was in the worst shape and needed to be brought back to the triage tent.

Wheeler, said this was where he needed to be. "I think this is why everybody joined the Navy. All the corpsmen and docs go to school for field medicine. This is exactly what we envisioned and now we're out here doing it. "If we have to be here, this is where I want to be."

As flight after flight of relief supplies left the airfield and patients came in as they returned, one thing was certain: the Sailors of ALCSG were there to help, and all were willing to stay as long as they were needed. As more relief support arrived and things began to settle down as far as getting supplies to and from where they needed to be, the overwhelming sentiment of the American servicemembers and the international aid workers at Aceh was the same. They were all there to help. □

JO1(SW) Juatai is a journalist with the Public Affairs Office, USS *Abraham Lincoln* (CVN-72).

Krakatoa Aftermath

In August 1883, the sloop-of-war USS Juniata steamed to the Indonesian Islands to assist in rescue operations, following the eruption of Krakatoa. The ship's medical officer Surgeon George W. Woods, kept a journal detailing the sights and activities encountered. A good portion of his description could easily describe much of the devastation caused by the recent tsunami in the Indian Ocean. The following is an excerpt from Dr. Woods' journal published in the 1884 Report of the Surgeon-General of the Navy.

From Batavia the Juniata proceeded, under orders from the Navy Department, to the Straits of Sunda, for the purpose of offering assistance to the survivors of the terrible calamity of August 26, 1883, when, succeeding an eruption of the volcano of Krakatao [sic], a tidal wave had swept over the southern coast of Sumatra and the northern shore of Java, obliterating towns and villages and drowning thousands of people.

Krakatao [sic] (situated in latitude 6 degrees 7' 8" south, and longitude 105 degrees 26' east, 26 miles west-southwest from the town of Anjer) is one of the most prominent of the many islands in the Straits



Artist's rendering of 1883 eruption of Krakatoa. Image from www.drgeorgepc.com.

of Sunda, being 2,750 feet in height, and, with its many coves, has always been a well known landmark to all navigators entering the Indian Ocean by this gateway to the East. Verlaten Island lays to the northward and westward, and Long [sic] Island, to the northward and eastward, is only separated from it by a narrow channel, the general opinion prevailing amongst geologists that these smaller islands are portions of the margin of an old crater, while the peaks of Krakatao [sic] are elevations within the crater itself.

The last record of volcanic action in Krakatao [sic] was in 1682, when,

in the month of May of that year, preceded by local disturbances for a period of nearly two years, an eruption occurred lasting for a considerable period. It then became quiescent and so remained for almost exactly two centuries up to the month of May, 1883. On the 20th of this month earthquakes were felt in Batavia at 1030 a.m., continued through the 21st, though at Anjer and other nearer points no disturbance was felt. On the 21st smoke issued from the mountain, and on the 22nd it was fairly in a state of eruption. The crater was below the summit on the side toward Verlaten Island, and within a few days was ejecting steam, smoke, dust, pumice, and molten stone, accompanied by great noise. The smoke and dust rose in gigantic columns with a terrific roar to a great height, part of it being carried by the monsoon to the westward, and an upper current transporting it eastward, so that on the 24th it was deposited in places more than a thousand miles distant. To the westward it descended on the decks of vessels, and as they approached the straits great quantities of floating pumice were encountered. The disturbance now being local, public interest in the eruption ceased, and no alarm was felt up to the day of the great catastrophe.

The first record of increased activity is the 21st of August, when the fall of pumice and ashes was so great that ships feared to enter the straits. This continued up to the afternoon of the 26th of August, when the volcano became still more active, accompanied by explosions at short intervals, and at 4 p.m. of this day the waters receded, immediately rolling in upon both shores of the Straits, inundating the villages and doing much damage. It, however, created

only a temporary alarm, most of the people of Anjer flying to a cemetery on slightly elevated ground back of the town, but on the recession of the tidal wave returning to their homes, a few only seeking the security of the mountains.

Simultaneously with this tidal movement the sky became of an inky blackness, and at Batavia, 80 miles distant, the fires of the volcano could be seen with a great column of smoke issuing above them, around which the lightning was constantly playing, and ashes were deposited within a few hours at distances of 500 miles. Ships in the vicinity were involved in the electrical storm, and their decks strewn with fine pumice or ashes. The magnetic and barometric disturbances were very marked from this period, the barometer constantly fluctuating, and compass needles being in continual motion.

Thus the night passed away until 6 a.m. of the 27th, when a most terrific explosion occurred, heard on the coast of India and in the Straits settlements, and within half an hour, the waters receded as on the previous evening, though to a lower point, and returning as a lofty wall of water swept both coasts, crushing houses, leveling forests, and carrying out to sea as it declined nearly 30,000 people, the fragments of their houses, and countless bodies of domestic and wild animals. During three days the volcanic activity continually augmented, throwing out incalculable masses of material, maintaining an impenetrable sky over both Sumatra and Java, the complete darkness constantly broken by the play of lightning over the dark vault.

Between 10 and 12 a.m. of the 27th of August, the final act occurred in a series of terrific explosions rec-

ognized at a distance of 1,500 miles, and this great outburst of internal fires, the most remarkable of the century, was at an end.

On the morning of the 28th the sky began to clear, and in a few hours the sun was shining on the scene of devastation, ruin, death, and wreck of mountains. Ships approaching the straits for several days had to pass through shoals of dead bodies of human beings and animals, including many tigers, material of buildings, forest trees, and masses of pumice. Late as our visit was in the vicinity of the volcano, large quantities of pumice constantly floated by the ship.

Anjer was a small town situated at the eastern extremity of the straits, and a place of call for all ships going to and returning from the East, where they received orders and obtained supplies. It was a well-built [sic] place, with an iron landing-pier [sic] and a light-house [sic], and was the point of landing of the European telegraph cable. It was situated in a plain gradually rising towards the volcanic peak of Kurang, 5,943 feet in height, and was set in the midst of luxuriant groves of palms. Opposite to the town, and in mid-channel lies "Thwart the Way," and irregular wooded island rising to the height of 450 feet.

We found "Thwart the Way" island swept, as by some mighty plow, great swaths of palms mowed down by the rushing tidal wave, which had completely destroyed its well-known [sic] features, giving rise to the report that it had been separated into five distinct islands.

Landing at Anjer we came upon a scene of most complete desolation. Anything more utterly complete is inconceivable. The iron pier was represented by a few twisted rods;

the light-house [sic] was gone, and of the city not a vestige [sic] could be seen. The whole plain was a che-vaux-de-frise of prostrate cocoanut [sic] trees, intermingled with sand and fragments of coral rock. A few household utensils were to be seen, a few splinters of furniture, bits of clothing, broken crockery, and childrens' toys, but only fragments; houses and people, and everything not entangled in the fallen timber, having been washed into the sea.

We found two or three poor fellows wandering among the ruins who told us their tale of woe, which was simply that they were among the few who had sought security in the hills and escaped the second fatal wave, but had lost every relative and all their possessions. They were living on the cocoanuts [sic], which plentifully strewed the ground, oblivious to the sickening odors which emanated from beneath the debris of fallen timber where we could see the crushed bodies of many poor creatures decomposing rapidly under the influence of a tropical sun.

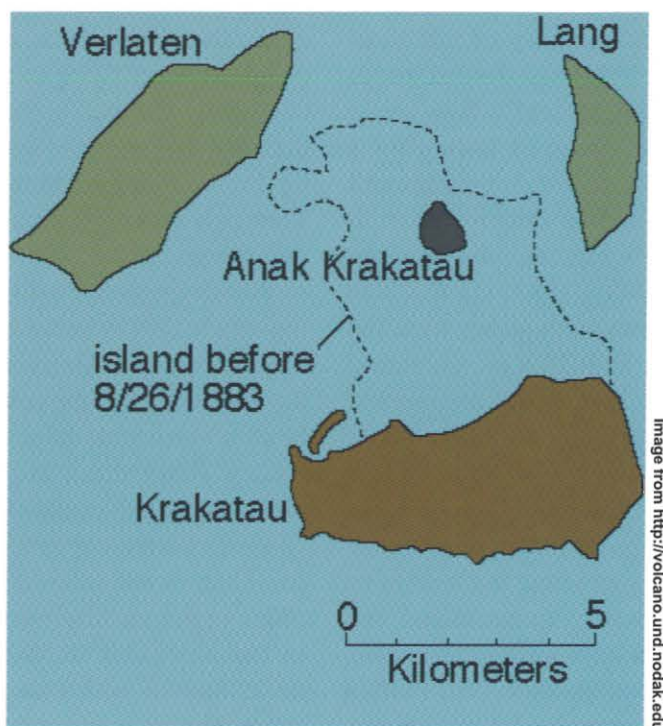
We made a superficial survey of the channel through the entire straits and an exploration of Krakatao [sic] between the 8th and 12th of September.

Krakatao [sic] is the western landmark of the Straits of Sunda, and has been described as rising to the height of 2,626 feet, the highest of several prominences in a mountain range running in a direction nearly from north to south for a distance of 1¼ Miles. It was an island of rocky barren hills, about 5 miles in length, with an average breadth of 3 miles. It was separated from Long [sic] Island by a narrow channel one-half to one-quarter of a mile in width, had Verlaten Island to the northwest,

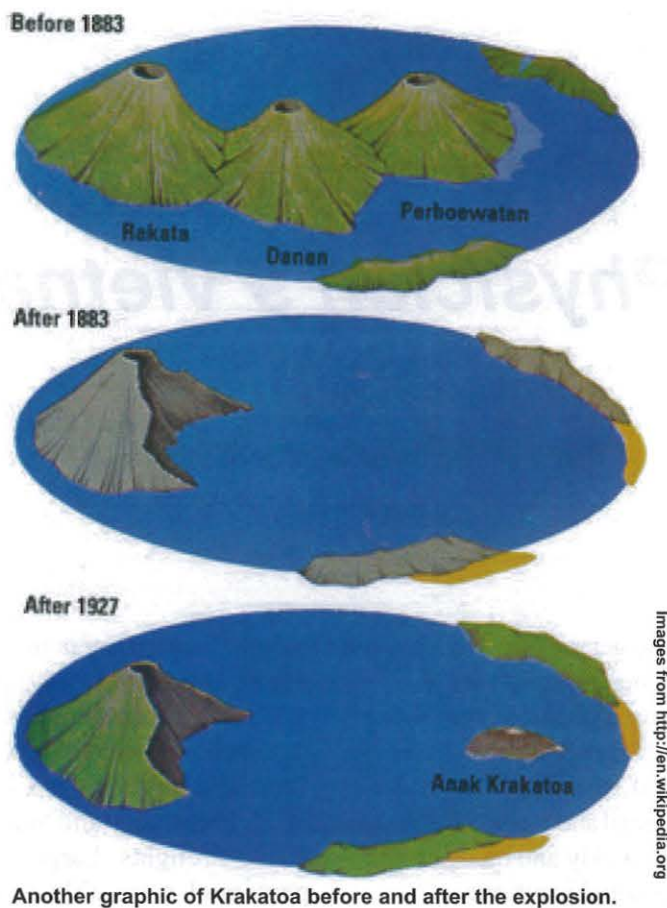
also separated by a narrow channel, and a small round island, the "Polish Hat," to the westward of Long [sic] Island. Bezee, lying 12 miles to the northward and eastward of Krakatao, [sic] has a peak rising even higher than that of the latter, and before the events of August 26, was a fertile island, on which a large colony was engaged in the culture of pepper. The two channels, traversed by ships bound to and from Anjer, were the Great Channel, following the line of the northern coast, and the Bezee Channel, between Krakatao [sic] and Bezee Islands.

The features of all these related landmarks were now much altered. The whole northern portion of Krakatao [sic] with its short mountain range of three peaks, had disappeared, and one half of the volcanic cone, with the crater on its western face, seemed to have been split off, the extinguishing of its fires causing the tidal wave which had swept so

disastrously over the adjacent shores. Sand and fragments of pumice were rolling down its fractured surfaces, raising small clouds of dust, which appeared like jets of steam, and the slopes of the island, once covered with verdure, were now spread with lava and ashes. Long [sic] and Verlaten were also covered with a deep stratum of lava, the former being somewhat elevated, and the "Polish Hat" had disappeared. Bezee had been devastated by the tidal wave, its plantations destroyed, and all its inhabitants, a thousand in number, drowned with one single exception. The Great Channel was found to be unaltered, but in the Bezee Channel two new islands and shoals had formed in water where previously there had been 30 to 40 fathoms, rendering this route a dangerous one until new surveys should be made. The changes near Krakatao [sic] are a greatly increased depth of water near the shore opposite Long [sic]



Krakatoa before and after the explosion.



Another graphic of Krakatoa before and after the explosion.

Island and the elevation of two small islets.

The extent of the disaster in Sumatra was probably greater than in Java, the tidal wave reaching a height of over a hundred feet. At Telok Baton Bay, the Dutch admiral's premises, on a bluff 104 feet above the beach, was invaded and the house nearly destroyed, while of three hundred chiefs assembled at a certain rendezvous to negotiate with the Dutch resident not one escaped.

Within a brief period after our departure from the Straits of Sunda, careful surveys were made by the Dutch and English Governments, and charts showing all the various changes were at once issued. The various phenomena attending this remarkable event were also carefully studied by competent scientific men,

who have published their conclusion embodied in many scientific papers.

All seem to agree that the repeated explosions were caused by an admission of water into the crater through subterranean openings causing a rapid generation of steam. The first of the two tidal waves is supposed to have caused by a portion of the island being detached and carried northward, where it now constitutes, on the new chart, Steers' Island; and the last great wave was coincident with the actual lifting of a large portion of Krakatao, [sic] which was projected through the air, over Lang Island, a distance of 7 miles, in a northeasterly direction, where it now forms the island of Calmeyer, it being completely proven by analogies of formation, that these are not upheavals, but actual fragments of Krakatao [sic].

To fill vacant spaces left by the separation of these great mountain masses, the water flowed in upon the volcanic fires, causing a recession along the shores, and a subsequent advance as a great tidal wave, with the terribly fatal results already described. Strange to say, these waves are unrecorded by ships in the vicinity on the 27th, though the undulations were recognized and noted in many remote regions, as in South Africa, the Mauritius, Japan, and other Pacific islands.

Two ocean currents have been noted as moving east and west, and corresponding atmospheric currents have been demonstrated by the ashes, or fine pumice deposited in their course; and the products of combustion sent upward in the great column which rose from the crater of Krakatao [sic] during the period of its greatest activity, and were projected to an incalculable height above our atmosphere, are supposed by many scientific men to have caused, in their slow descent, the various phenomena of colored skies so constantly observed in almost every quarter of the globe during a period of many weeks succeeding August 26, 1883, the day of the most violent eruption.

These phenomena made a regular progression from places in the vicinity of the Malay Archipelago to the China coast, Japan, the more eastern Pacific islands, the Pacific coast of the United States, and Mexico, and so on in their journey around the world. □

Dr. George W. Woods was born in Massachusetts on 24 August 1838. After obtaining a medical degree from the University of Virginia in 1861, he entered the Navy as an assistant surgeon. He retired in 1895 as a medical director with a service record of 14 years at sea and 20 years of shore duty.



Charlie MED

A Physician's Vietnam Journal

CAPT William B. Mahaffey, MC, USN (Ret.)

Part VI (Conclusion)

Celebrities, reporters, official military visitors, reservist surgeons, politicians, Vietnamese dignitaries, Red Cross workers, and USO volunteers! We had visits from them all. The first celebrity I recall was Ann-Margaret. She flitted about the wards in the shortest possible dress and was a real charmer while talking with our patients. She was delightful.

Legendary radio and TV performer, red-haired Arthur Godfrey, also made a relaxed, welcome appearance. In his radio and TV shows he often talked about his skills as a private pilot. He arrived in a Marine Corps Huey helicopter, though I doubt that he had piloted it himself in Vietnam. After an unrushed visit to the wards, he accepted some liquid refreshment in our O-Club and chatted amiably. Just as he entered his helicopter for departure, I approached the aircraft to get a better photograph of him. He reached out and grabbed me by the elbow and pulled me closer. While asking a host of questions about where I was from and what my job was, he maintained a strong grip on my arm. When he relaxed that grip, he said to all of us,

"We have to get moving. I'm damned proud of you guys."

Charlton Heston's visit was a whirlwind visit, but like all of the Hollywood types who visited, he seemed cordial and sincere. He visited the wards quickly and then promptly moved on with his retinue.

A number of sports figures passed through during their off-season periods. It was interesting to watch one professional baseball player, who undoubtedly pocketed quite a nice paycheck at home, when he encountered one of our hospital corpsmen who had been drafted out of a minor league position. The nature of their lengthy conversation remained private.

As a Buckeye from Ohio, I was tasked with escorting Ohio's Senator Taft through the wards when he visited. Patients weren't nearly as impressed by a visiting politician as they were by athletes and the likes of Ann-Margaret. Senator Taft promised to call my parents upon his return to the States and he did.

No entertainer has been admired by deployed American servicemen and women over the decades than Bob Hope, who brought his large

troupe of entertainers to South Vietnam during the Christmas season of 1966 and entertained the troops in many locations. He visited the Danang area in 1965, a day or two after Christmas and during a lull in the firefights. Large numbers of personnel were able to enjoy his extravaganza.

Martha Raye was our real sweetheart. For those too young to remember, Martha Raye was a comedienne who had gained much fame in the days of black and white television. She had a marvelous toothy smile which extended almost from ear to ear. In retirement, she capitalized on that famous smile by starring in TV ads for some product that supposedly whitened dentures. But Martha Raye was also a lieutenant colonel in the Army Nurse Corps Reserve and when visiting outfits in Vietnam she wore a combat uniform with embroidered rank devices. I was privileged to see Martha Raye twice in Vietnam, once at Charlie Med the summer of 1966 and again at Delta Med at Dong Ha very late in 1966. Her funny girl personality dominated her leisurely visits with the appreciative patients in our wards. At Charlie Med, she

sat down in Central Supply and had a good chat with the OR techs while drinking coffee from a canteen cup. At Dong Ha, she came into the OR while I was watching a patient with a spinal anesthetic. Martha Raye commandeered my stool and talked briefly with the smiling patient while she made a perfunctory blood pressure check. When she left the OR, she purposely placed a bold red lipstick impression on the surgical mask she had been wearing and handed it to one of the OR techs. He tacked it over the door. I hope it was never removed.

Martha Raye must have also visited prior to my arrival in December 1965. The small bridge spanning the ditch that ran between the helicopter pad and our triage tent sported a sign that read:

MARTHA RAYE BRIDGE

Throughout the year, many lesser sports figures and Hollywood celebrities would pass through, most of whom seemed to have genuinely fine personalities with a true interest in the well-being of the troops.

Members of the news media occasionally visited in small teams. Some were entirely conscientious and considerate, doing a noble job of reporting the war factually. Others were a real pain. News crews sometimes barged right into the triage area, sticking their microphones in the faces of injured Marines. I recall one of them asking "What's it like out there, Soldier?" One never refers to a Marine as a Soldier! I'm certain that the fine Soldiers of the United States Army also prefer not to be called Marines.

On another occasion, we watched one reporter film his story. As he finished interviewing several ambu-

latory patients and corpsmen outside a ward, he heard a helicopter making its approach to our pad. It was an older model with a reciprocating engine that did not perform as reliably in Vietnam as newer models with turbine engines. That older type had been relegated to administrative duties such as guard mail runs and the delivery of supplies. When the reporter heard that venerable old helicopter approaching, he repositioned himself and posed with it in the distance, apparently as an audience-electrifying backdrop. While being captured on film, he hunkered down in the billowing dust and stated, "As helicopters continue to bring in even more loads of casualties . . ." He invariably sported an unnecessary flak jacket and finished his report with the inevitable "This is John Doe [pregnant pause], Danang [pause], Vietnam."

On two occasions, my photograph made the news weeklies, once while caring for a Marine in the triage area and once while silently consoling a Vietnamese woman as she stood by her lifeless child who had just become another innocent victim of the war.

Stateside hospitals face an unending but necessary barrage of inspectors from a whole spectrum of federal and state agencies. Though Charlie Med was certainly no hospital requiring "oversight," we did receive a few official military visitors. Most were legitimate medical bureaucrats on justifiable fact-finding trips. These good guys were appreciative and inquisitive, and they stayed out of the way without trying to "help." Those with graying hair probably had Korea behind them. Their visits undoubtedly assisted us by increasing the efficiency of the supply channels, by expanding the understanding back

home of the problems we faced, and by bettering the preparation of medical personnel being sent to Vietnam. Certainly all of the Navy's stateside hospitals, but especially the Navy's orthopedic rehabilitation hospitals at Oakland and Philadelphia, deserved better insight into the limited facilities available to the medical battalions. It was at these medical battalions that their hundreds of mangled patients were first treated in Vietnam. Most likely, these official visitors served that function well.

There was, however, the occasional visitor who was less welcome.

Since we were a medical outfit only a short distance from the American Red Cross and USO facilities near "The Big PX," we had occasional visits from their personnel. The USO personnel were serious about their work of providing services to servicemen and women at home and overseas. The cheerful "Red Cross girls," to my amazement, often wore light blue wash-and-wear dresses as uniforms in a combat zone.

The citizens of South Vietnam obviously appreciated our presence whether the conflict was justifiable or not. The mayor of Danang and other highly placed civilian authorities visited Charlie Med occasionally to express that appreciation verbally. The mayor was once accompanied by a group of dignified Vietnamese ladies who presented each of us a napkin or handkerchief embroidered with the words "Danang, Vietnam." A strange but meaningful gift in a combat zone, I still have mine. Military officials from the Army of the Republic of Vietnam (ARVN) also visited occasionally to bolster the good relationship between the two countries' armed forces.

When I had the opportunity to revisit Vietnam on my own in 1993,

that friendly fidelity from those once loyal to the former government of South Vietnam was still quite evident. In 1993, Western visitors were still very uncommon in Vietnam. Men who would have been old enough to fight in the '60s and '70s often approached us Westerners on the streets with a betel nut-stained smile and asked "Where you from?" and "You know my son in Chicago?"

But as a whole, visits to Charlie Med by senior Marine Corps officials were the most welcome. We naturally benefited from their inevitable words of appreciation. Their paternal attitudes toward our post-op patients were gratifying.

The atrocities of war notwithstanding, I gained an immense amount during my 13 months in Vietnam with Charlie Med. I grew professionally. I made a little progress on becoming somewhat of a grown-up man.

During my internship in Iowa City, IA, in 1962-3, it was becoming obvious that any healthy young American physician was likely to be drafted eventually for service in support of the Vietnam conflict. To cope with that eventuality, young physicians in training like myself were offered the Berry Plan. Under that plan we would be deferred though our internship and residency training periods with the understanding that we would commence 2 years' military service immediately following the completion of residency training in a medical specialty. This was a far better option than being drafted unexpectedly out of a new private practice situation. On a cold snowy Iowa day, I rode the train to Des Moines and was sworn into the Naval Reserve as a "Berry Planner." With that paperwork in hand, I would then be able to complete my anesthesiology residency

before commencing military duty. Though I chose the Navy over the Army and the Air Force from the very beginning, I had never even the slightest thought of spending more than 2 years in the Navy.

Looking back on 1965-6 at Charlie Med and the years that followed, I know that I never would have made the Navy a 23-year career had I not spent those 13 months with the Marines in Vietnam. Those were formative years for me and my experiences in Vietnam had an immense effect.

It is worth mentioning here why Navy medical personnel sometimes "serve with the Marines." Unlike the Army and the Air Force, The Department of the Navy is composed of two proud services, the United States Navy and the United States Marine Corps. Since the Marine Corps has no physicians, dentists, medical administrators, chaplains, hospital corpsmen ("medics,") or dental technicians of their own, these personnel are provided to deployed Marine Corps units by the Navy. In most cases, this is a very satisfying relationship. Some hospital corpsmen almost cross the line into the Marine Corps.

I returned from Vietnam with a strong loyalty to the Marine Corps, though I personally could never be a Marine. Navy personnel who served with the Marines in Vietnam are authorized to wear on one of their Vietnam ribbons a small black FMF device depicting the Marine Corps Eagle, Globe, and Anchor. While seeing patients and riding the elevators back at Naval Hospital Portsmouth, I would routinely encounter Marines wearing ribbons (far too many of whom were wearing Purple Heart ribbons) indicating recent Vietnam service. As I took note of their ribbons,

they would sometimes notice the FMF device on my Vietnam ribbons. A brief moment of silent eye contact would often follow acknowledging that special relationship between Marines and Navy medical personnel who serve with them in combat. Sometimes I might ask one of them, "Who were you with?" A brief reply such as "Echo Two Nine" was sufficient. They knew that I knew how Two Nine's combat outfits had come close to being wiped out in Vietnam in 1966. I must say, however, that this special relationship is the strongest between Marines and "Doc," the Navy hospital corpsman.

Following my return to Naval Hospital Portsmouth, in early 1967, I rather boldly negotiated with RADM [Joseph] Yon, my CO, offering to remain in the Navy an additional 2 years but only if I could be transferred to the Naval Hospital at Marine Corps Base, Camp Pendleton, CA. After being reminded that such bartering by junior personnel was slightly unorthodox at best, my offer was promptly accepted. During my 23 years in the Navy, that bartered 2-year tour at Camp Pendleton was possibly my most enjoyable tour of duty.

Looking back on my year in Vietnam, I matured in several dimensions. Professionally, I had gained vast experience in trauma anesthesia. Although the horrendous casualties we often saw in Vietnam were almost never seen "fresh" in stateside hospitals, I had become entirely comfortable dealing with major trauma following my year at Charlie Med. When I first returned to the pristine operating rooms at Portsmouth, I had difficulty adapting to a daily schedule. In Vietnam, we worked hard when there was work



Photos courtesy of author

Aerial view of Charlie Med:

- 1. ICU/recovery room
- 2. Quonset housing Or 1 and OR 2
- 3. Quonset housing OR 3 and OR 4
- 4. Helicopter pad

- 5. Triage tent
- 6. X-ray
- 7. Lab
- 8. Patient's six-holer
- 9. Malaria ward

- 10. My hooch (shared with five others)
- 11. O-Club
- 12. Enlisted housing
- 13. Refrigerated morgue



Busy OR: Patient with land mine injuries to all four extremities.

to be done until we were finished! Period! At Portsmouth, I couldn't imagine at first tying up an OR with those nickel-dime cases such as gall bladders, hemorrhoids, and hernia repairs.

In Portsmouth, I moved back into the same high-rise apartment building on the Elizabeth River where I had lived 13 months before. I didn't know their destination, but military helicopters sometimes followed the river rather than flying over large populated areas on either bank. For years, when I would hear the thwop-thwop-thwop of a Huey or even the grinding whine of a CH-46, my gut reaction would still be "Incoming casualties!!" In fact, 35 years later, I still have a trace of that.

The practice of anesthesia is said to be 99 percent boredom and 1 percent panic. We anesthesiologists earn our living by being fully prepared to cope calmly and rationally with those unexpected "1 percent" events. A properly selected chimpanzee might be trained to handle the other 99 percent. While in Vietnam I gained an infinite amount of experience that helped me deal more calmly with those "1 percent" events for many years to come.

In an unquantifiable way, I also "grew up" in Vietnam. I had by no

means lived a sheltered life as a young person, but, with no apologies whatsoever, I had been just a farm boy who had raised hogs to earn college money. At The Ohio State University I was active in fraternity life, but college, medical school, and specialty training were all completed within the protection of academic walls. I arrived in Vietnam as a very well trained anesthesiologist but also a very naive and impressionable young man. While living in a medical battalion and working with men who used a spicy vocabulary to discuss worldly matters, I shed much of the naïveté that had characterized my earlier years.

Regular exposure to unbelievable numbers of dead Marines and to countless hideously mangled Marines and hospital corpsmen in the ORs eventually had its effect on me. For the first several months, I was totally stunned. I was simply numb. I just worked, ate, and slept. I didn't ponder what I was seeing. I turned 30 during a quiet period in the summer of 1966. On the fingers of just one hand, I could count the few people over 30 whom I genuinely respected. On my birthday, I meandered to the far side of the idle helicopter pad where I sat and stared over the rice paddies while I very seriously pondered the mean-

ing of life. That day, I just wanted to be alone to think things out. I wasn't depressed. But I was now an old man of 30 uncontrollably surrounded by waves of dead and brutally injured young Americans. Fortunately, my 30th birthday was a quiet day at Charlie Med. I don't recall that any casualties came in. Then it was back to business as usual, but into a new decade of my life. The growth process that day was positive.

When I arrived at Charlie Med in December 1965, I was just this big kid who happened to be trained as an anesthesiologist. When I finished my tour with the 3rd Medical Battalion, I felt I had aged at least 10 years in so many dimensions.

I spent my final few weeks in Vietnam with Delta Med at Dong Ha near the Demilitarized Zone or DMZ. In a small permanent Vietnamese building near the new Dong Ha Air Base, we established Delta Med, a very primitive medical facility with only one OR. Just prior to returning to the States at the completion of my tour, I returned to Charlie Med at Danang for a few days to pack out. Yes, I was leaving Vietnam. But of greater importance, I had come to have profound respect for the teams I had worked with at Charlie Med and Delta Med. They were superb teams. As I sat in the back of a "six-by" truck with several other co-workers returning to the States, I know I had a few tears in my eyes as we drove away from Charlie Med to head for the Danang Air Base. Sure I wanted to head home, but oh, how I hated to walk out on that splendid team! □

Dr. Mahaffey is retired and resides in upper Sandusky, OH.

Effectively Managing the Psychological Wounds of War

CDR Mark C. Russell, MSC, USN
LCDR Devin Shoquist, MC, USN
HM2 Gary Chamber, USN

On 16 February 2003, Fleet Hospital Eight, Bremerton (FH8), arrived in Rota, Spain in support of Operations Enduring and Iraqi Freedom. Led by CO CAPT Patrick Kelly, MSC, and XO CAPT Mark Pickett, MC, the 650-member staff built a 116-bed, then 250-bed hospital which served as one of two major medical evacuation hubs; the other being Army Medical Center, Landstuhl, Germany.

Upon arrival in Spain, the 116-bed fleet hospital configuration had limited provisions for mental health outside of sharing a split psych/medical ward. Initial mental health staffing consisted of one psychologist and one psychiatric technician. That mission eventually grew into a 250-bed complex that added a psychiatrist and four more psychiatric technicians to the mental health department. Two other psychiatric technicians were assigned to the Psych/Med Ward along with a psychiatric nurse. The stated role for mental health was primarily to see psychiatric patients. Work space for mental health was initially confined to a cornered off section of the ward. Due to privacy concerns for what were primarily staff member patients before the arrival of combatants, a metal connex* box was added outside the temper tent hospital which served as the Mental Health Clinic (MHC).

At present, there is no standard of care for the management of the psychological aspects of warfare for either combatants or healthcare providers in the post 9-11 environment.

Without a clearly defined mission other than to see a few expected "psych" patients, we started to think about how we could best utilize our time. We came up with a

"two-prong" approach aimed at serving both our internal (staff and command) and external (patients) customers. Specifically, we wanted to prepare the staff to deal with the psychological effects of deployment and provide care to those who are likely to have some kind of emotional reaction to their wartime experience, as well as to develop a program for early identification/intervention, rehabilitation, and prevention of the psychological effects of war in service of our patients.

To this end, we first developed a series of lectures including combat stress identification and management, Post Traumatic Stress Disorder (PTSD) management, and management of violent patients, and embarked on a mission to train as many staff as possible. We realized that no matter where people worked in the fleet hospital, they were either encountering operational stress themselves, and/or would be exposed to patients who have or may have symptoms associated with traumatic combat experiences.

Several staff members were experiencing some minor adjustment difficulties coping with separation from their families, the transition to living in huts or tents, the frequent rains and mud, and working in a tent environment that was much different than the brick and mortar we were accustomed to. So the combat or operational stress talks were geared toward the hospital staff. We also started a separation support group along with pastoral care, led by CDR Anthony Trapani, CHC.

In addition to the staff trainings, we were tasked by our director, CAPT Greg Hoeksema, MC, to assess staff morale and make recommendations that would help with the upcoming transition from a 116-bed to 250-bed hospital. Over 80 staff were interviewed, which led to several recommendations that appeared to help the

*Connex containers are 20-foot and 40-foot steel containers used by the shipping industry.

transition occur more smoothly and provided a boost in morale. An outline of the first strategy to prepare and provide mental health services for the hospital staff and command are detailed below.

Hospital Staff Care Program.

- The FH8 mental health department (MHD) conducted staff training prior to the onset of conflict that included topics such as how to identify and manage combat stress, PTSD, and other psychiatric conditions, as well as how to manage violent patients, and restraint training.

- A Crisis Intervention Stress Debriefing (CISD) team was formed and training was conducted. The CISD was activated on one occasion at FH8 following the traumatic death of a patient.

- A separation support group for hospital staff was developed and co-facilitated by pastoral care and mental health staff.

- The combat stress trainings were also geared toward healthcare professionals themselves and how they could best manage their own operational stressors.

- Stress "Decompression" groups were conducted for hospital staff that worked on the medical and surgical wards, ICU, and casualty receiving (CASREC). Many of the staff were young and on an operational deployment for the first time. Staff were taught how to manage their own intrusive recollections from witnessing traumatic injuries and caring for wartime casualties.

- FH8 Command requested two sets of staff morale assessments that were carried out by the MHD staff near the beginning of the deployment and toward the end. Results were used to help the senior officer and enlisted leadership to identify and resolve numerous morale issues.

- The MHD also developed patient satisfaction surveys whose results were shared with hospital staff to provide patient feedback and boost staff morale.

- Access to mental healthcare was informal and readily available to staff.

- Lastly, the command mandated that all hospital staff receive a post-deployment debriefing geared toward healthcare professionals.

On 18 March 2003, a proposal was submitted to and approved by the CO to employ the use of mental health assets in a historically unprecedented manner. Developing methods of early identification of combat-related stress disorders in combatants, a rehabilitation program to return combatants to their frontline units, and efforts to prevent post-deployment difficulties for both combat-

ants and the healthcare providers charged with their care. These programs are described below.

Screening/Early Identification Program.

- FH8 command policy was that all patients, regardless of reason for medevac, were to receive a combat-stress screening.

- The screening instrument selected was the Impact of Events Scale (2) whose intrusive symptoms scale has been described as the best predictor for PTSD.(3)

- 1,341 patients, or 97 percent of the 1,400 total patients at FH8, were screened.

- The psychiatric technicians and ward nursing staff were responsible for ensuring that screening occurred.

- Of the 1,341 patients screened, 377 (30 percent) required further evaluation.

- The psychologist and psychiatrist conducted mental health evaluations after enlisted technicians gave the patients a structured clinical interview.

- Of the 377 patients evaluated, 158 (42 percent) met criteria for a combat-related diagnosis (52 percent acute stress disorders, 29 percent adjustment disorders, etc).

- Therefore, 11 percent of all FH8 patients, who were not previously identified in-theater as having combat-related stress or "psych" reactions, were identified early and recommended for further intervention when returned to CONUS.

- For the vast majority of patients, who were often wounded or medically ill, the screening and evaluations served as the first time to discuss or "debrief" their combat-related experiences. Many expressed gratitude for the opportunity.

- Anecdotally, many of these patients reported relief and sustained improvement after only one to two sessions. It should be mentioned that many of these patients did not meet criteria for mental health disorder, but did complain of high number of combat-related stress symptoms. It is believed that many of the more mild combat-related stress cases may have been prevented from developing into a more chronic condition by the interventions described above.

Reconditioning Program.

- FH8 command created the first ever "reconditioning" unit for a fleet hospital, set-up and managed by CDR Elum O'Neal, NC, whose mission was to provide rehabilitation to patients who were convalescing or recovering from either minor medical conditions or battle



FH8 Mental Health Team. Bottom row (left to right) HM2 Luis Gomez, HM2 Mary Dee, HM2 Elizabeth Kosierowski, HM2 Michael Gamjobi, and CDR Mark Russell. Back row (left to right) HM2 Eric Richards, CDR Elum O'Neal, LCDR Devin Shoquist, and HM2 Gary Chambers.

fatigue, with the goal of restoration and return to their frontline units.

- The U.S. Army Medical Command doctrine describes establishment of reconditioning units in the Communications Zone (COMMZ) with the expectation that 5-10 percent of these patients can be returned to duty. Whether such programs have ever been stood-up before is unknown.

- The Navy has never developed or implemented a formal reconditioning program during any previous deployments of fleet hospitals and hospital ships.

- A 10-12-bed ward was established that was separate from medical and surgical wards. Duration of the reconditioning program was up to 14 days. The unit consisted of a highly structured military setting and therapeutic milieu with a schedule of daily events.

- Treatment strategies included daily physical fitness training, combat-support groups, general military training, and command-related duties.

- The senior member was the NCOIC or OIC of the program during their stay, and was responsible for mustering, detail assignment, etc.

- Patients wore uniforms and were addressed by rank.

- Patients received medical and psychological evaluations to determine suitability for the reconditioning program.

- A standard operating procedure (SOP) was developed, and the mental health department staff oversaw the program.

- A total of 110 patients, or 7.8 percent of all FH8 patients, were assigned to the reconditioning unit.

- Of the 110 patients, 85 (77 percent) were returned to full-duty and returned back to their frontline units in Iraq or Kuwait.

Post-Deployment Debriefing Program.

FH8 command also adopted the policy that to the extent possible, all FH8 patients would receive a post-deployment debriefing. The purpose of the debriefing was to serve as a homecoming brief to help with the transition from an operational environment to a non-operational environment.

None of the patients at FH8 had received a similar briefing during their medevac process. Many patients related that this was the first such briefing they had received in their military careers despite previous deployments.

Many patients had questions and reservations about returning home secondary to traumatic images and experiences they had encountered.

The FH8 Chaplain and mental health staff conducted the "debriefings," which covered topics on coping with changes at home, significant others, children, other family members, work-related peers, managing the media, coping with combat stress symptoms, and tips on what to avoid and where to go for help/support.

Approximately 80 percent of all FH8 patients received the debriefing. Patient incapacitation, patient refusal, high operational tempo (OPTEMPO), and staffing shortages prevented all patients from receiving the briefing.

Patient satisfaction survey results revealed that over 91 percent of patients rated the debriefings as either "very helpful or helpful."

Operation Iraqi Freedom began on 30 March 2003 and "ended" when President Bush declared an end to major hostilities on 1 May 2003. During the war, FH8 received three medevac flights per week with an average of about 35 patients per flight. The OPTEMPO for mental health in particular was fast and furious. Average length of stay at FH8 was between 3-5 days. Therefore screenings for all newcomers, identifying and managing the ebb and flow of reconditioning patients, and providing a post-deployment briefing for departing personnel was a challenge. The staff did an outstanding job in coordinating department services, and an equally superb job of running the reconditioning program. The enlisted psychiatric technicians proved to be an invaluable resource. They were responsible for the screenings,

initial evaluations, and vast number of post-deployment debriefings. Any successes enjoyed by the department and command were directly attributable to the efforts of the enlisted corpsmen.

Conclusion

At the time of writing this article there remain approximately 137,000 coalition troops in Iraq and another 15,000 troops in Afghanistan. Estimates are that the duration of the rebuilding efforts will be at least 5 years. Troops operationally deployed throughout the world are vulnerable to experiencing chronic combat-related stress, especially in the context of the unpredictability of terrorist or guerrilla attacks.

For regions such as Iraq and Afghanistan, where guerrilla and terrorist tactics are the norm, the closest parallel from a psychological standpoint would be Vietnam where the long-term psychological effects of warfare are well-documented. According to the National Vietnam Veterans Readjustment Study, of the 3.14 million men and women who served in Vietnam (1964-1975), 15 percent of males and 17.5 percent of females in combat-related units have been diagnosed with PTSD (4) with over 830,000 Vietnam vets meeting criteria for clinically significant stress reactions. Over 30 percent of combat veterans experienced significant readjustment problems after redeployment including 19 percent higher suicide risk, 15 percent unemployment, 53 percent work-related difficulties, and 40 percent of the homelessness.(5) In addition, 38 percent of marriages of Vietnam veterans broke up within 6 months of homecoming.(4)

Screening and early identification/intervention of combatants exposed to severe combat-related stress is

essential in reducing the risk of developing PTSD. Of the 450,000 Vietnam veterans diagnosed with full-PTSD and 350,000 diagnosed with partial PTSD, fully 50 percent still have PTSD to this date at considerable personal and financial cost. At this time, however, there is no formal policy for the screening, early identification, and intervention of Soldiers, Marines, Sailors, and Airmen, who serve in these operational billets.

The Army has documented the importance of treating battle fatigue or combat stress related casualties as close to the frontlines as possible, with the understanding that those who can be rehabilitated and returned to their units tend to fare better overall than those who are separated from their units.

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CDR Russell is Head, Substance Abuse Rehabilitation Program, Naval Hospital Bremerton, WA.

LCDR Shoquist is Staff Psychiatrist, Naval Medical Center, San Diego, CA.

HM2 Chambers is Psychiatric Technician, Naval Hospital Corpus Christi, TX

Communal Toileting as a Risk Factor for Shipboard Diarrhea

CAPT Frederick Foote, MC, USN

Viral gastroenteritis (VGE) is a well-known scourge of ships at sea. A brief, nonlethal, yet prostrating illness, it may spread rapidly through the ship's crew. This spread is thought to be by personal contact, rather than by water or food. Noroviridae (Norwalk-like viruses) have proved responsible for most outbreaks where an organism has been identified. Large-deck ships (aircraft carriers and amphibious assault ships) have proved particularly susceptible: outbreaks on large decks have involved as many as 747 cases. The Navy VGE Project recorded eight major outbreaks on these ships in FY03, seven of them in the cooler months between September and February.(1) There is a tendency for outbreaks to occur following port visits.(2,3) Civilian cruise liners have also had well-publicized outbreaks of VGE.(4) Shore commands and deployed Marine units have suffered outbreaks, and disease in the US civilian population is estimated to total 23 million cases per year.(1,5)

USS *Iwo Jima* (LHD-7), a new WASP class amphibious assault ship, endured a VGE outbreak of moderate size (199 Navy, 56 Marine cases) while returning from deployment on 12-23 October, 2003. This report discusses the outbreak and describes some features that may offer clues as to manner of spread and possible means of prevention. Comparisons are made to USNS *Comfort*, a Navy hospital ship with no recent history of diarrheal outbreaks.

Materials and Methods

Iwo Jima is a large helicopter assault ship, with a complement of 1,305 Sailors and Navy staff. While deployed in October, 2003 it also had aboard about 1,700 embarked Marines. Among Navy personnel, the crew was approximately 85 percent male, 15 percent female; average age was 19 years, with a range of 18-52. Environmental conditions on "large deck ships" such as *Iwo Jima* are often challenging. The interior of the ship is an artificial environment without natural ventilation. Because of continual operations on the flight deck, it is normal for crew members to go days, sometimes weeks, without exposure to sunlight. High stress and long working hours, often in a war environment, lower resistance to infection. Officers on *Iwo* live in 1-4 person staterooms with attached toilets. Enlisted live in large berthing areas with as many as other 248 persons; Marines occupy separate berthing areas. Enlisted beds (appropriately called "racks") are stacked three-high. These areas have attached shower/toilet complexes with rows of commodes. A few isolated commodes exist in isolated work spaces, but toileting is mainly done in berthing. Enlisted Sailors and Marines eat on the mess decks, a large cafeteria-style facility with good standards of food sanitation. Sailors and Marines share the same serving line underway. Officers eat separately in the wardroom, also a cafeteria-style facility with its own kitchen. Chief petty officers (77

in number) also have a separate dining facility, called the Chief's Mess.

USNS *Comfort* is a hospital ship, the sixth largest hospital (in terms of bed capacity) in the world. It is manned by up to 1,200 Navy medical personnel and has space for 1,000 patients. Enlisted berthing conditions on *Comfort* are similar to those on *Iwo Jima*; officers live in 6-8 person staterooms. In keeping with the egalitarianism of medics, officers and enlisted use the same food service line. In contrast to *Iwo Jima*, Sailors on *Comfort* have access to a large number of toilets both in berthing and in their work spaces (the wards). The author served in sick bay on *Comfort* from 1997-2003. As described in the text, diarrheal disease was essentially unknown, beyond a few sporadic cases, on *Comfort* during these years.

USS *Iwo Jima* left Norfolk, VA, for its maiden deployment in February 2003. Crossing the Atlantic and the Mediterranean, she took part in operations in the Adriatic and the Persian Gulf, and landed Marines in Northern Iraq and the Horn of Africa. In July, the ship proceeded to the other side of Africa and operated as part of Joint Task Force Liberia in August and September. This was marked by a serious outbreak of falciparum malaria affecting 90 Marines. The ship conducted a port visit in Rota, Spain (unmarred by any disease issues) from 5-12 October, and then sailed across the Atlantic for a 2-week journey home.

The diarrhea outbreak on *Iwo Jima* began with four sailors taken ill on 12, 13, and 14 October 2003. Their symptoms were those of classic VGE: frequent vomiting and watery diarrhea, without blood, fever, or leukocytosis, but with considerable prostration due to cramps, dehydration, and malaise. The Sailors were given Phenergan to stop vomiting, hydrated IV, oral fluids, and returned to their racks in berthing. The number of cases continued to climb, with 15 recorded on 15 October. The galley was cleaned, food handlers checked, and a hand-washing campaign instituted; but cases increased to 26 on the 17th, and 31 on the 18th of October (Figure 1). By then sick bay was inundated, the wards were filled with patients, and staff were working day and night. Many patients were spending the night in sick bay because of cramps and dehydration. A dip in new cases on 19 October brought hope to the embattled medics, dashed on the 20th by a surge to 62 new cases that day. The galley was screened again, but the outbreak curves, which showed a gradual increase in new cases to a peak on day 8, suggested a contact-borne rather than a food-borne epidemic. In consequence, emphasis was placed on isolation of cases. All new patients were confined in the medical spaces, and were allowed to use only the medical head. The number of cases then dropped rapidly, with the last one recorded the evening of 23 October (12 hours before the arrival of 800 dependents for a holiday cruise). The organism responsible for the outbreak was not identified: the few stool samples taken were lost before the ship reached port. However, the clinical and epidemiologic picture was typical of Norovirus-mediated VGE.

Data on the outbreak for Navy personnel was obtained by a combination of sick call records and daily rosters kept by the author. Only persons reporting to medical for treatment were counted. Data on

berthing and toileting were obtained subsequently. Therefore, this is a case-control study. Data on Marines were restricted to raw counts of cases per day provided by Marine medical staff, without details of age, rank, or berthing area. Results were subjected to statistical analysis using linear regression via the least squares test for Figure. 2 and the Pearson Chi-Square test for Figure. 4, using linear regression via Microsoft Excel and Chi-Square via SPSS for Windows, copyright Microsoft Corporation 2000.

Water potability on *Iwo Jima* was assessed with daily sampling for halogen levels, and weekly testing for presence/absence of coliforms using the Colilert kit (IDEXX Laboratories, Inc.). No positive findings were obtained during the diarrhea outbreak.

Results

The data from the *Iwo Jima* outbreak were marked by two striking divergences (Figure. 2). First of all, the attack rate for Navy personnel was 15 percent ($=199/1305$), that of embarked Marines only 3 percent ($=56/1700$)—despite both groups using same food service line and dining area. This argued against the mess decks as a source of disease transmission. As noted above, the outbreak curves supported the same conclusion. Second, among Navy personnel, attack rates were inversely proportional to military rank. The risk of diarrhea in junior enlisted (below E-7 rank), greatly exceeded that of junior officers and chief petty officers, while senior officers (department heads and above) remained free of the disease. This tended to rule out the work spaces, shared equally by all ranks, as a site of disease spread. The environment of Sailors includes two other areas: berthing spaces and toilets (heads). These two could not be separated statistically. Each berthing had its own attached toilet area, with the number of berths (which

varied greatly between the various sites) generally proportional to the number of associated commodes. But given the nature of diarrheal disease, and the density of the personal contact within communal toilet areas, it seemed possible that crowded toilets might be a risk factor for the disease.

Figure 3 shows the risk of diarrhea (percent attack rate) as a function of the number of persons per commode in a given berthing/toilet unit. Each point represents a different berthing area. Senior officers, who shared a commode with, at most, two to four other people, are to the left in the graph, while, junior enlisted, who shared with up to 27 persons per commode, are to the right. Junior officers and chiefs occupy an intermediate position. The risk curve declines abruptly, signaling decreased disease transmission, in the region of 10-15 persons per commode. This may be a critical level for disease spread. Figure 4 divides Navy personnel into those sharing a commode with 12 or fewer, versus more than 12, other persons. The incidence of diarrhea in the former group was 171/1000, that of the latter only 13/1000, a statistically significant difference. The odds ratio, approximating the relative risk between the groups, was 15.5.

Other data contributed little to the analysis. Within the Navy divisions, males and females became ill in proportion to their numbers onboard. All major departments were affected, with a range from 8 percent (Operations and embarked staff, which contained a high proportion of officers) to 18 percent (C5 and Deck). Medical had a 29 percent attack rate, probably because of exposure to ill personnel. A detailed breakdown of personnel by race was not available at the time of writing, but cases during the outbreak appeared roughly proportional to the overall ethnic makeup of the crew.

In the analysis above, it was difficult to separate crowded berthing

from crowded toilets as a risk factor for diarrhea. Some light may be shed by data from USNS *Comfort* (T-AH 20), a large hospital ship whose crew numbered, in three deployments between 1998 and 2003 (about 6 months total underway time), between 600 and 1,200 Navy personnel. The author served in sick bay on *Comfort* from 1997-2003. During this period, no outbreaks of diarrhea were observed, and only infrequent sporadic cases, despite frequent contact with shore-based, often seriously ill, visitors, and patients from the Baltic Sea area and the Middle East. Figure 4 compares the berthing area size, and the number sharing commodes on *Comfort* versus *Iwo Jima*. Both ships have equally crowded berthing, but because of *Comfort*'s function as a hospital ship, her Sailors have access to a far greater number of commodes. The total number of persons per commode (leaving out sick and wounded who never numbered more than 400), falls well below the critical threshold of 10-15, which may explain the *Comfort*'s relative immunity to diarrhea. These data, which separate out the relative impact of crowded berthing and crowded heads, are further evidence of a link between communal toileting and the risk of diarrheal disease.

Discussion

Our data indicate that communal toileting is a risk factor for epidemic shipboard diarrhea, and that reducing this below a certain level may protect against the disease. The exact threshold of safety is uncertain, but given the variability in the region of 10-15 in Figure 3, a threshold of no more than 10 persons per commode would seem a prudent number. On *Iwo* and *Comfort*, no berthing area with a ratio less than 10 experienced significant diarrhea. This deserves the attention of naval architects. Newer Navy ship designs (the DDX and LPD-17 classes), are moving toward more spacious conditions for the crew.

The reduced crew sizes expected may further ameliorate this problem, which is as old as seafaring. But the challenge of ensuring hygiene on large troop ships and carriers is likely to remain, and to require ingenious design solutions.

For those practicing on today's vessels, the importance of rapid isolation should be borne in mind. In September 2003, and again in March 2004, mini-outbreaks of VGE occurred on *Iwo Jima*. In these two instances, the first five cases were immediately identified, placed in strict isolation, and allowed to use only the medical toilet. The resulting outbreaks were small, comprising 15 and 30 cases respectfully. In the large October outbreak, in contrast, the first five cases were allowed to return to their own berthing, and an epidemic promptly followed.

Crowding as a risk factor for diarrhea has been previously reported by Sharp et al, who found that the risk of diarrhea aboard an aircraft carrier was two to three times greater for those living in crowded sleeping quarters (more than 50 per compartment). Crowded toilet facilities were not a specific focus in that study.(6) Thornton et al noted a clustering of cases around selected berthing/toilet facilities in a 1999 epidemic on USS *Pelilieu*.(2) Other causative factors that have been cited in VGE outbreaks include poor general hygiene, water-borne spread, and transmission through the food service facilities.(2) While these may sometimes be operative, they did not appear crucial during the outbreak described here. Cleanliness and general hygiene were above average on *Iwo Jima*, a crack ship of the line which won numerous Navy awards, including the coveted Battle "E", during this deployment cycle. Water was tested daily for halogen levels and weekly for coliforms, without any positive findings during this period. The food services received stringent weekly inspections and were felt to be well

above average in general hygiene. This division subsequently received the Ney Award for the best large-deck food service activity in the Atlantic Fleet. There was an unusually high rate of diarrhea among the food service attendants (FSAs), who did not cook but performed table service on the mess decks: their attack rate was 42 percent (=19/45), a rate exceeding even the 29 percent rate in medical. Given the preponderance of evidence against food-borne spread, this probably reflects the FSAs' exposure to the utensils and saliva of sick diners; but it may reflect a food-borne contribution to the outbreak that should be taken into account. Nonetheless, the full spectrum of data indicate that crowding in toilets, and perhaps associated crowding in berthing, were the key factors in the spread of the epidemic. We regret that we were unable, due to loss of specimens, to identify the organism responsible for the *Iwo Jima* outbreak. The epidemiology, attack rates, and clinical manifestations were those of classic Norovirus-mediated VGE. Other investigators have made substantial progress in determining the organisms involved in these epidemics (2,3,7). This may ultimately lead to vaccines or therapeutic interventions. We would argue, however, that eradication of Norovirus would not, in and of itself, put an end to shipboard diarrhea. If favorable conditions persist, it is likely that another micro-organism would come to occupy this environmental niche. Changing the environment to make transmission more difficult will be equally important in eradicating VGE. In connection with our findings, this means decreasing the number of persons sharing a commode below the threshold value of 10.

The occurrence of VGE on civilian cruise liners raises additional questions. If VGE is a disease that spreads because of an insufficient number of toilets, why do these luxuriously outfitted ships fall victim to

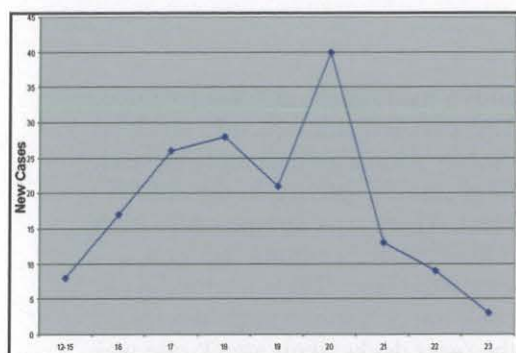


Figure 1: Outbreak curve for diarrhea epidemic on USS Iwo Jima. 12-23 October 2003.

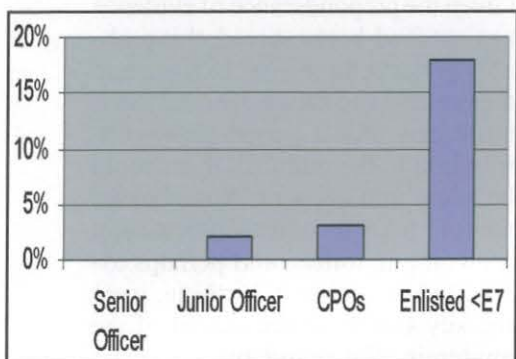


Figure 2: Risk of diarrhea vs rank.

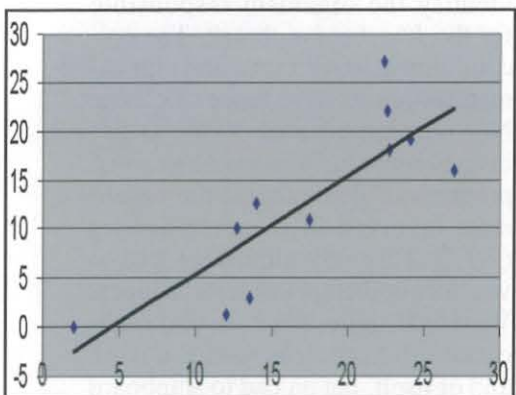


Figure 3: Risk of diarrhea vs number sharing commode. Each point represents one of the ship's berthing areas. Linear regression from least squares fit via Microsoft Excel copyright 2000.

	DIARRHEA	NO DIARRHEA	INCIDENCE OF DIARRHEA	ODD RATIO= AD/BC
>12 SHARE COMMODE	(a) 197	(b) 956	17.1%*	15.5
12 OR FEWER SHARE COMMODE	(c) 2	(d) 150	1.3%*	

Figure 4: Effect of communal toileting on diarrhea rates. *Statistically significant difference Pearson Chi-Square 25.9, $p < 0.0001$.

the disease? One explanation might focus on a difference between Navy and civilian ships: the presence in the latter of large recreational common areas with dedicated toilets. Where such facilities exist, they might serve as loci for communal toileting (more than 10 to 15 persons using one commode), sufficient to produce transmission of disease, even if other toilets are also available to the passengers. This hypothesis should be tested on cruise ships. If it proves to be correct, modification or closure of the relatively few communal toilets should decrease the occurrence of diarrhea on these vessels.

There is a need for prospective studies on the epidemiology of VGE. This is feasible because of the frequency of outbreaks; several such studies has already been conducted, with illuminating effect (2,6,7). To evaluate the suggestions made here, one division of a large-deck ship should be offered a large number of extra toilets, perhaps by assignment of the toilets of an adjacent troop berthing space. Diarrhea rates of that group could then be compared to the rest of the crew. As VGE also occurs among troops ashore, a trial among troops in bivouac might also advance our knowledge of the role of communal toileting in diarrheal disease.

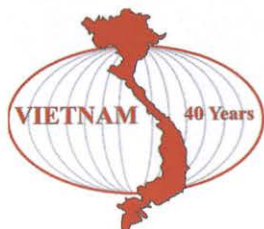
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Dr. Foote is assigned to the medical department, USS Iwo Jima.

	Total Navy Personnel	Avg. # Personnel/ Berthing Space	Total # of commodes on board	Avg. Persons/ Commode
USS IWO JIMA	1305	Officer=1-4/Space Enlisted=138/Space	90	14.5
USS COMFORT	1188	Officer=6-8/Space Enlisted=222/Space	221	5.4 or 7.2 (if 400 patients included)

Figure 5: Comparison of berthing density and number of commodes between Iwo Jima and Comfort. Berthing areas were comparable but number of commodes was much greater on Comfort.



Purple Heart Nurse

N*ew Englander Ann Darby Reynolds graduated from nursing school in 1961 and immediately joined the Navy. Her first assignment was working the surgical ward at Naval Hospital Pensacola, FL. Receiving orders to Fort Sam Houston, TX, for a mass casualty course, she arrived the same month President Kennedy was assassinated. "We had to wear [black] arm bands while we were there. I came home for Christmas leave and got a special delivery letter saying, 'Congratulations, you have orders to Saigon.' I had no idea where Saigon was."*

I remember the heat and the smell of Saigon when I stepped off the plane. The smell was just something that was indescribable. They rushed us right into a building so we could be debriefed. CDR Ann Richman was the chief nurse in Saigon at the time. She had come out to meet me. I was a lieutenant j.g. We went through three or four days of orientation. We learned all the things we were not supposed to do in Saigon. We were never to go out alone. We were always to go in pairs. We were not to get into those cycloes [bicycle taxis]—you rode in front and the driver was behind you. They could throw a grenade if they wanted to get you. Be careful going into taxicabs. We were not to go out after dark. But the big thing was going in pairs. We heard that they had a price on the heads of the medical personnel. A nurse was worth \$25 dollars and a physician \$50. So they always told us to be very careful because if they got one of us and took us across the river that might be it.

My duty station was the Station Hospital Saigon. The hospital itself was quite unique. It was an old apartment building with five floors. The ICU was on the first and we had one elevator which did not work half the time. There was a water purification tower on top. We had a little annex which was attached to the hospital where we kept some of the other medical patients. And there was a little area in back of the hospital where they had built the operating room. It was really just one big room divided in sections for surgeries and recovery. There were two or three tables set up there.

When I first arrived, we had a lot of medical and surgical patients and those from terrorist bombings. There were a lot of shrapnel, punji stick wounds, and things like that.* We had a few burn patients from plane

crashes. People came in from the field with these injuries. They were all American personnel. We could do just about anything. We did a lot of orthopedic surgeries and some amputations. We did whatever had to be done and then we medevaced them out.

I was the youngest member of the staff at the time. I remember when I checked in, everybody was so surprised I was there because I was so junior. We did everything, but I actually worked surgical, ICU, and medical wards, and took operating room call. There were seven of us at the time—the chief nurse and nurse anesthetist plus four Thai nurses. With rotating shifts and days off, we usually had only three or four on duty at one time. The rest of us all rotated on nights for OR call. And that usually kept us quite busy because you never knew what was coming in. We started off working 5 days, and then as things progressed we worked 6. I think for the most part we worked the 6-day schedule during the time I

*The Viet Cong frequently planted these sharpened sticks in shallow pits beneath roads or paths. Their purpose was to pierce the feet of unwary soldiers.

was there. Later, as more casualties began coming in, they began working 7 days. When I first arrived, the hospital had just been opened. The only other military hospital was one in Nha Trang, which was an Army hospital about 250 miles north. Between the two, depending on where the fighting was going on, we kept quite busy.

We'd get a call at night. A terrorist bomb had gone off in or outside the city, and there were so many casualties that they'd bring them in. We would get so many that everybody would be at work. You could be there for maybe 24 hours trying to get everyone settled and get them through surgery. As time went on, those times became more frequent. After the dependents left, the fighting really increased. And it seemed that every other day we were sending medevacs out because the hospital was so small. We just couldn't handle them.

Terrorist attacks were something you got used to after being in Saigon for a while. It was nothing to walk down the street and have a bomb go off in a movie theater or a restaurant. They had a club there called the Circle Sportif. It was like a country club with a swimming pool and tennis courts. I know I was there a couple of times when a bomb went off outside the perimeter. I remember walking by a couple of restaurants and had gotten just far enough away when a bomb went off. After a while, we almost got used to it. Fortunately, there weren't that many people who were injured when they did go off, at least when I was there. As the fighting increased, there were more and more casualties. Usually after a bomb attack, we had five or ten people injured so we were able to take care of them.

Our living arrangements in the Brink Hotel were actually quite good.



LT Reynolds receives her Purple Heart. "When they told us we would be awarded the medal, they insisted that we wear our blues. But I felt we should be in our nurse's uniforms because that's what we were there [in Vietnam] for. So, they relented and that's how we received our Purple Hearts—in nurse's uniforms and caps."

Photos courtesy CAPT Darby Reynolds

It was seven stories and we had a suite on the first floor, which was really the second because the cars would park under the first floor. So technically we were on the second floor. Four of us shared a suite of rooms. We all had our individual bedrooms, which were air conditioned. We each had a balcony. And there were two large sitting rooms, two bathrooms, and a kitchen. When we went out the door of our suite, the elevator was right there. It would take you up to the top of the building, which was where the restaurant, the mess, and the officers' club was. There were movies and entertainment up there. Half of the top floor was open and you could watch the activity from the countryside. Sometimes you could hear bombs going off or see flares going up.

The hotel was a compound with a fence around it. In the beginning,

things were pretty open. You could come and go as you wanted. But as the terrorist activity increased, MPs were on duty where you entered the compound. It really wasn't very secure because most anybody could get through. In fact, that's what happened when the bombing took place. Somebody drove through and the car wasn't really checked that closely.

The physicians and nurses lived separately. None of us all lived together in the same building. There were four of us in our suite at the Brink, and then later on another nurse joined the staff, she was billeted on an upper floor. Three other more senior nurses lived about 4 miles away from us. That's where LCDR Bobbi Hovis, CDR Tweedie Searcy, and CDR Ann Richman lived. We were separated in case anything should happen. That's also what they did with the physi-

cians. None of them were all in the same building.

The Brink was about 6 miles or so from the hospital. Each day, we'd have breakfast at the top of the BOQ. Then we would come down and the car would come and take us to the hospital.

There we would get the report on the status of the patients from the night before. Then we did the bed baths, the medications, etc., and got patients ready for surgery. That was pretty much the routine. One thing that does stick in my mind is meals for the patients. There was no kitchen at the hospital so the food was prepared at the BEQ [Bachelor Enlisted Quarters] down the street. The food was then put on a cart and a man wheeled it up the street and into the hospital. For breakfast we had dehydrated eggs and milk. We prepared the trays and then delivered them to the patients. With the five floors—and since the elevator didn't usually work—we were always running up and down the stairs with food trays. It was a lot of extra work. Because of that elevator, we always had to keep the sicker patients on the first floor because there was no way to transport them.

We worked until about 3 or 3:30 when the other shift would come on. Then the car picked us up and took us back to the BOQ. Depending on what you wanted to do, you were free until the next morning. Many times we'd go out shopping because we were free to do that. Often supplies in the hospital were low so we would just walk along the sidewalk and find a lot of supplies and instruments we might need that never made it to the hospital.

There was a big black market for many items we desperately needed. I remember one time we had a very

sick patient—an orthopedic patient—and didn't have the instruments for the surgery. We had to wait until a plane could bring the instruments down from the Army hospital in Nha Trang so we could operate. Once we finished, we had to send the instruments back.

A few times I had a few close calls in Saigon. Once I had gone shopping and caught a cab. At the beginning, you weren't supposed to go by yourself but I did. The cab was heading across the river. We all knew a little Vietnamese at that time. I knew how to tell him to stop and let me off. But we also had a price on our heads. This cab driver began driving across the river and didn't stop. Many of us carried a little knife or something. I had to pull my knife, tap him on the shoulder, and tell him to stop so I could get out.

There were other times when just getting back from the hospital was an effort because demonstrations were going on. One time they were burning cars going to the hospital. The city was just in an uproar. There were military police riding in the car ahead of us but we got caught in the demonstration and the bullets were flying all over. We had to duck down in the car or risk being hit. If we hadn't had the military police as escorts, we never would have gotten out of it.

If you wanted to stay in your room and do nothing you could do that. But if you wanted to get out and see a little bit of the city, which they called it the "Paris of the Orient," or if you wanted to go to church on Sunday, or just meet other people, you had to go alone. You couldn't always rely on one of the other nurses being free to go with you.

Then we became the target of a terrorist bomb. It was Christmas

Eve. I remember that very well because Christmas is always special to people. I also remember that I had the operating room call. I guess I was the unlucky one because I remember the doctor saying "Okay, Reynolds has got the call again."

We had a pool going to see what time we were all going to be called back. I was in my quarters looking out, as we had a maid and we had given her her Christmas gift. They were checking everything very closely because Bob Hope was in town and was going to have a big show. He was staying across the street from us in another BOQ, and they wouldn't let the maid go out of the gate with her Christmas present. I was looking out of my room through the French glass doors and had my face pressed up against the glass. Ruth Mason had gone downstairs and was just returning when, all of a sudden, the bomb went off. The door blew in and the glass just broke—shattered and fell right down on top of me. I thought, "Oh, boy. Hospital OR call. Here we go!"

I was wearing sneakers and had remembered from one of my previous times in the operating room how uncomfortable I was standing for so many hours in sneakers. This time I wanted my nurse's shoes. So in a state of shock, I went back to my room to get those. I remember a couple of fellas coming in and saying, "You've got to get out of here. The building's on fire." By the time we got out the door and downstairs, you could see the flames and smoke. Out in the little courtyard, I saw all the damage and the victims starting to come out.

At that point, the nurses all checked on each other to make sure we were okay. Then we began checking all the casualties as they were coming out. When the ambulances began arriv-



The Brink Barracks following the Christmas bombing.

ing, I got into the first one and took some patients to the hospital. I didn't realize at the time that I was bleeding. When we got to the hospital, one of the corpsmen said, "Oh, you need to be sutured so I'm putting a [suture] set aside for you." He knew that before long we would be short on supplies.

Then we just went to work taking care of patients and getting them settled. I waited until everybody was taken care of and then they sutured my leg. I remember one man in the next suite of rooms at the Brink. He was buried for several hours. They found him around midnight and brought him into the OR to try to save him but he died on the table right across from me while they were working on my leg. That was something I'll always remember. Two men were killed in the suite next to ours.

Four of us nurses had been injured. Fran Crumpton had ear problems. The rest of us had lacerations and concussions. I also had a cervical injury. Later on, when I was stationed at Oakland, a physician told me my problem was probably from the bombing. Eventually, I also had to have a cervical fusion.

Later that night, Fran and I went back to the Brink. It was difficult getting through the city because everything was in an uproar. There were no lights. I finally got to my room. One thing really sticks in my mind. When I got there, my radio was still playing Christmas carols.

The Brink bombing resulted in more than 100 Australian, South Vietnamese, and American casualties, including two deaths among the latter. The four Navy nurses who

had been injured—LTJG Ann Darby Reynolds, LT Frances L. Crumpton, LT Ruth A. Mason, and LT Barbara A. Wooster—were awarded the Purple Heart, the only Navy nurses during the Vietnam War to receive that decoration.

In February 1965, a Viet Cong mortar attack on the U.S. base at Pleiku, in which eight Americans were killed and more than 100 wounded, prompted retaliatory air strikes against North Vietnam.

LT Reynolds still had a whole career ahead of her after she returned from Vietnam. She retired from the Navy in 1988, and resides in Dover, NH. □

In Memoriam



LCDR Eldene E. Paige, NC, USNR, last of the 11 World War II Navy nurses held prisoner by the Japanese, died on 5 December 2004 in Chico, CA. She was 92.

Eldene Paige was born 9 December 1913 in Hot Springs, SD.

After spending her childhood in California, she became a registered nurse and joined the Navy Nurse Corps in 1938. Her first assignment was at Naval Hospital Guam, and her second, at Naval Hospital Cañacao in the Philippines. When Japanese bombers destroyed the nearby Cavite Navy Yard on 10 December 1941, she and her fellow nurses cared for the many casualties. They remained on duty at Cañacao until Japanese forces captured Manila, at which time LT Paige and the entire medical unit became prisoners of war.

The nurses were then interned at the Santo Tomás internment camp in Manila, which contained 3,500 men, women, and children. Under the leadership of chief nurse Laura Cobb, she and her colleagues worked in the camp hospital, much of the time without adequate food, medicine, or instruments.

In May 1943, the Navy nurses were moved to another internment camp, a former agricultural college at Los Baños. There they worked in the camp hospital until their dramatic rescue on 23 February 1945 by the U.S. Army.

LT Page and her comrades received the Army's Bronze Star Medal and the Navy's Gold Star in lieu of a second Bronze Star for meritorious service in the Philippines during the Japanese attacks of 1941-42, and through their more than 37 months of imprisonment. She ended her Navy career in the Naval Reserve serving at Naval Hospital Camp Pendleton, CA, from 1950-51.

As a civilian, Eldene Paige worked as an RN at Butte County Hospital in Chico, CA, and then at Sacramento County Hospital until her retirement in 1969. □

BUMED Archives, Dorothy Still Danner Collection



Carl Mydans, the famed *Life* photographer, caught this poignant scene during the Los Baños Raid of 23 February 1945. While riding atop a U.S. Army amtrac, Navy nurses Dorothy Still (left) and Eldene Paige (right) comfort a prisoner who has fainted.

Book Review

I Die with My Country: Perspectives on the Paraguayan War, 1864-1870 edited by Hendrik Kraay and Thomas L. Whigham. University of Nebraska Press, Lincoln, NE. 2005. 258 pages.

It is impossible to gain a true appreciation for conflict without grasping the medical aspects and human toll of warfare. The Paraguayan War was the most far-reaching war in Latin America. It involved Brazil, Argentina, Uruguay, and Paraguay. The University of Nebraska Press studies wars, conflict, and society and it opens 2005 with a book on an important conflict in the historical psyche of South America. It is a war that decimated 60 percent of the population of Paraguay.

The war began with Paraguay, a landlocked nation that saw itself as a regional arbiter between the great South American powers of Brazil and Argentina. It backed this arbitration role with military expansion. When Brazil, a nation of 10 million, decided to send forces into Uruguay, Paraguay responded by occupying the Matto Grosso region of South Brazil. Paraguay gambled that Argentina, an historic rival of Brazil, would not intervene, or if it did, it would possibly intervene on the side of Paraguay. Paraguay miscalculated and thus began a war that raged for 6 years. The trench warfare employed in this 6-year war foreshadowed the trench warfare experienced in World War I.

The conflict ended with a triple alliance of Brazil, Argentina, and Uruguay subduing Paraguay and seeking to remove Paraguayan leader Francisco Solano Lopez from power. Lopez was killed by Brazilian forces.

From a medical perspective, Lopez realized early the need to stock up on medical supplies before the opening of hostilities. He ordered a shipload of medical supplies to be imported but the vessel carrying the shipment capsized in the Rio de la Plata, and the nation went to war without the medical supplies it required. Soldiers felt the loss of such crucial medicines of the time such as calomel (for internal parasites) and laudanum (for pain).

There is a chapter devoted to the role of women in the war. The need for nurses was so high that every Paraguayan family was obliged to send one daughter to be trained to serve with the military. The lack of modern medicines saw all sides valuing older women who possessed the knowledge of folk remedies, although these only offered the illusion of treatment.

Medicine dominates the letters of a Brazilian officer who described the ravages of cholera among the soldiers. These victims fared no better during their evacuation to

the rear. As the evacuation steamers transported them back to Brazil, the casualties were half naked and without the benefit of doctors or nurses. Brazilian doctors even tried to stem the tide of cholera by publishing hygiene instructions in local newspapers in southern Brazil and in occupied Paraguay.

When trench warfare settled around Humaita in 1866, the Paraguayans proved to have the most efficient medical evacuation system of the four belligerents. They established forward hospitals for each division and a larger hospital some distance from the battlefield for stabilization and surgery. Hospitals within Paraguay served for convalescents; those suffering from communicable diseases were evacuated immediately by oxcart or river boat to remove them from the general population. They were transferred to the Paraguayan capital of Asunción to the hospital that specialized in tropical disease. Later, railways evacuated the sick and wounded to a large military hospital in Cerro León.

What made the Paraguayan military doctors more efficient than their adversaries was a medical system influenced by British doctors who created the Paraguay medical system and instilled in their Paraguayan counterparts the lessons learned from the Crimean War. Dr. William Stewart, a Scottish physician, organized the Paraguayan military medical corps and used the lessons learned while serving as a doctor in the Crimean War (1854-1856), that influenced the development of modern nursing in warfare and battlefield hygiene.

Readers will learn that the highest death rate from disease came from dysentery. Smallpox, scurvy, and edema followed as the biggest killers. Doctors wrote in their files of 50 deaths a day from cholera and criticized folk remedies that had no chance against this disease.

I Die With My Country is recommended for those with a passion for field medicine, and the administration and management of casualties in warfare. Those medical planners, medics, and corpsmen supporting the Southern Command (SOUTHCOM) Area of Operation might find it very useful reading. □

LCDR Aboul-Enein is a Plans Operations and Medical Intelligence Officer assigned as Director for North Africa and Egypt as well as Special Advisor on Islamic Militancy at the Office of the Secretary of Defense, Washington, DC. He is the author of "*Ayman Al-Zawahiri, the Ideologue of Modern Islamic Militancy*" (Air War College Center for Counter proliferation, 2004) and co-author of "*Islamic Rulings on Warfare*" (Army War College Strategic Studies Institute, 2004).

Navy Medicine 1945



Dental officer LTJG Elizabeth Alice Tweed treats her patient at Naval Hospital San Diego.

BUMED Archives

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